Political Tyranny Over Business Will End

POLITICS has laid its hesitant hand on the whole commodity market.

Markets are affected marvelously by psychology. The dominant state of mind possessing buyers or sellers at stated times produces market changes. And dominant states of mind in the last analysis are generally based on fundamental conditions in the world at large, wage conditions, the financial and finally the import and export situations.

All these fundamental considerations are at this writing altogether bullish. Raw materials of all kinds, cotton, wool, iron and pulps have seen their final declines on this recent period of depression and are on the upturn positively.

Supply and demand conditions are healthy all over the world, which today is demanding with emphasis not only raw materials but also finished products somewhat feverishly because supplies have been consumed and production has not yet sufficiently replaced shortages.

The world demand for our wheat, rye, barley, oats and hog products alone is sufficient to supply the country with a veritable orgy of purchasing.

Wage conditions could not be better if made to order. Every industrial center is reporting added expansion in employment and greatly augmented payrolls.

The finances of the country are the Midas-minded marvel of the age. Never before in the history of this country has money been so cheap at the time commodity movements have gone over 1,000,000 cars per week. And never has credit been so abundant. Savings bank deposits show the stupendous, record-breaking sum of eighteen billion dollars.

Exports in July were $278,000,000—imports $278,900,000.

But in August exports were $330,000,000 and imports $260,000,000—a nifty trade balance of $70,000,000 in our favor, and a significant change of material betterment for all parts of the trading world. And yet domestic interchange of commodities hangs hesitant in many quarters.

What's the matter? Politics!

A challenge has been flung to the American people by certain classes desirous of obtaining the political dictation in these United States, through the control of Congress. Political control of Congress by a coterie of discontented, dismal, malcontents would mean that these same political buccaneers would immediately bludgeon business, through Sand-bagging Committees of Congress, empowered to investigate banks, railroads, stockyards, public utilities and every other institution connected with the prosperous upbuilding of this country's wealth and name. The object would be to discredit by the same character of characterless testimony as we beheld last spring, all those forms and customs and institutions builded through years of patient progress which are so essential to our financial, social and tolerant well-being. Of course, in face of a challenge like that business must hesitate.

But there is one thing sure, thirty days more of it is all we should be asked to endure.

The people of the country are never going to trade certain prosperity for certain failure. With the counting of the largest ballot ever cast for chief executive of this nation on November 5th, the country will cast off the hesitant hand of politics and bound forward, throttle wide open, into the best period of prolonged prosperity on record.

Three to one on it!!

NEARLY SIX MONTHS' WIRE LIFE!

A Michigan mill removed a Fourdrinier Wire from a BELOIT machine that had run *continuously* (except Sundays and holidays) from November 18th, 1923 until May 3rd, 1924

An exceptional performance for even a Beloit, but numerous instances may be cited of three months' life at 650 feet per minute and over.

Beloit Iron Works **Beloit, Wis., U. S. A.**

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On Nov. 4th, 1920, 26,000,000 people voted, BUT 27,000,000 did not. VOTE NOV. 4th. VOTE AS YOU PLEASE, but VOTE.

EDITORIALS

The Forestry Conference

IN order to obtain national recognition of the problem of perpetuating a supply of forest products sufficient to meet our needs and its attending necessities and demands, a national conference on Utilization of Forest Products has been called by Secretary Wallace, of the Department of Agriculture, to meet at Washington, D. C., November 19 and 20, 1924. In his letter, the Secretary said:

"As you know, the question of timber supply is becoming more acute year by year. We are studying it from three angles: First, how to protect the timber we have from fire, insect pests and plant diseases; second, how to encourage the growing of more timber, both on national forests and private forests; third, how to cut down the waste in the manufacture and use of wood.

"We believe that by better ways of manufacture and use, the drain on our forests can be reduced by at least one-fourth. This problem has not received the attention it should have. We need more facts than we have as the basis for a workable program. The responsibility is a joint one in which the public and the industries alike have a vital interest."

The Secretary has invited representatives of all the associations and industries financially interested in the manufacture and use of forest products, as well as the representatives of State forest organizations, the trade and general press, and public interest and educational groups, believing that the purpose of the conference is sufficiently important to justify the time and expense consumed attending it.

The paper industry should respond with the same measure of service and zeal that has characterized all of its past efforts in this work.

Correspondence Courses on Pulp and Paper Manufacture

FACILITIES for correspondence and class instruction on the manufacture of pulp and paper, available in the United States and Canada, have been published by the Joint Vocational Education Committee with offices at 342 Madison Avenue, New York City. It is shown that there are now two correspondence courses established—one offered by the Extension Division of the University of Wisconsin, and the other by the Institute of Industrial and Domestic Arts, Gardenvale, Quebec, Canada.

The instruction of these courses is based on the five volumes of text books prepared by the Joint Vocational Education Committee of the Pulp and Paper Industry of the United States and Canada.

These correspondence courses are aimed to serve three types of persons: First, the mill operative, by affording him a means of becoming familiar with fundamental laws underlying the operation which he performs, thus stimulating his interest and increasing his efficiency and earning power; second, the department head or foreman, by giving him an opportunity to study the various details connected with processes in other departments than his own; third, the technical man or the new executive in the plant by familiarizing him with the different processes and control methods involved in pulp and paper manufacture, not only in his own plant but in mills using any of the well known methods.

Although the courses will make a special appeal to those men who have had some high school or college training, instruction is so arranged that the man with only a common school education may take it profitably, especially if he has had considerable experience in the mill. Either unit courses or the complete pulp and paper course can be subscribed for. Preparatory courses are also available in each institution for those students who find themselves deficient in preparation.

If you are willing to spend an hour or two of your spare time every day to get a broader knowledge of your vocation and fit yourself for a position of more responsibility, no better opportunity is offered anywhere than the above courses of instruction and your efforts should yield you a golden return.

Paper Exposition in 1926

IT HAS been decided to forego the holding of the Third Paper Exposition in 1925 and to plan for a big exposition in 1926. One of the reasons for this decision is the changing of the meeting date of the annual convention of the American Paper and Pulp Association to the first week in February. The Grand Central Palace, where the Paper Exposition has in the last two years been held, will be occupied during the time of the convention, and it will not be practical to hold an exposition of paper machinery in any other building in New York City because of the great weight of the machinery, which the superintendents and managers of these buildings will not permit to be installed on their floors.

Another year has been hereby granted in which to work and build up support for a big exposition in 1926. From the recognized advantages such an exposition presents, we hope that it will receive the enthusiastic support of the entire industry.

Support the Supply Association

THE PAPER INDUSTRY rejoices in the success which seems to be attending the organization of the proposed Supply and Equipment Association of the Paper Industry. This new association which has the endorsement of the American Paper and Pulp Association through its president, Mr. Henry W. Stokes, and his associates, should be of great mutual benefit in protecting our home industry from the encroachment of foreign competition.

Those supply houses which have failed to take seriously the communication received from the Organization Committee headed by Mr. W. N. Wilkinson, of the Union Sulphur Co., 33 Rector Street, New York City, will be rendering great assistance to the American paper industry by giving the committee's letter prompt attention.

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THE PAPER INDUSTRY

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Vol. 6 OCTOBER, 1924 No. 7

Aerial Photography in Forestry, Logging and Engineering

By ELLWOOD WILSON
Civil and Forestry Engineer

WITH the increasing value of timber lands and the increasing distances of logging operations from the mills, it is becoming more and more important for executives to keep close track of their operations and to plan them efficiently and economically. No manager of woodlands can handle his timber lands intelligently without a map. He cannot get from his woods foremen all that is in their heads; he cannot possibly see for himself all his territory, and he cannot plan a log-

Figure 1

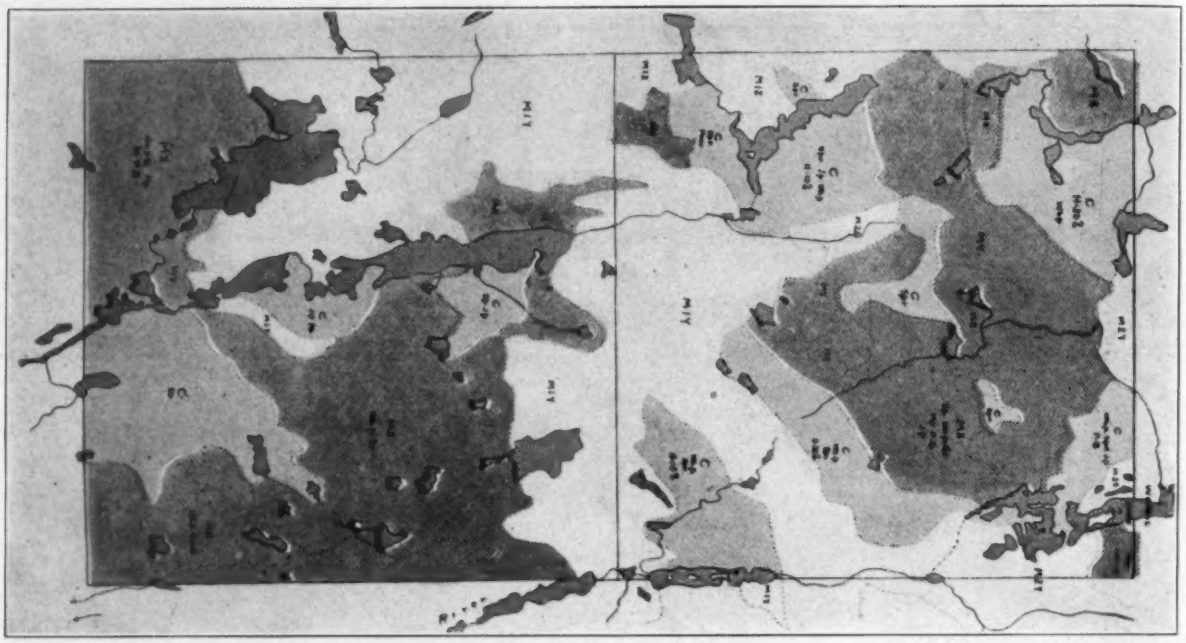

Fig. 2—Sketch Map from Aeroplane

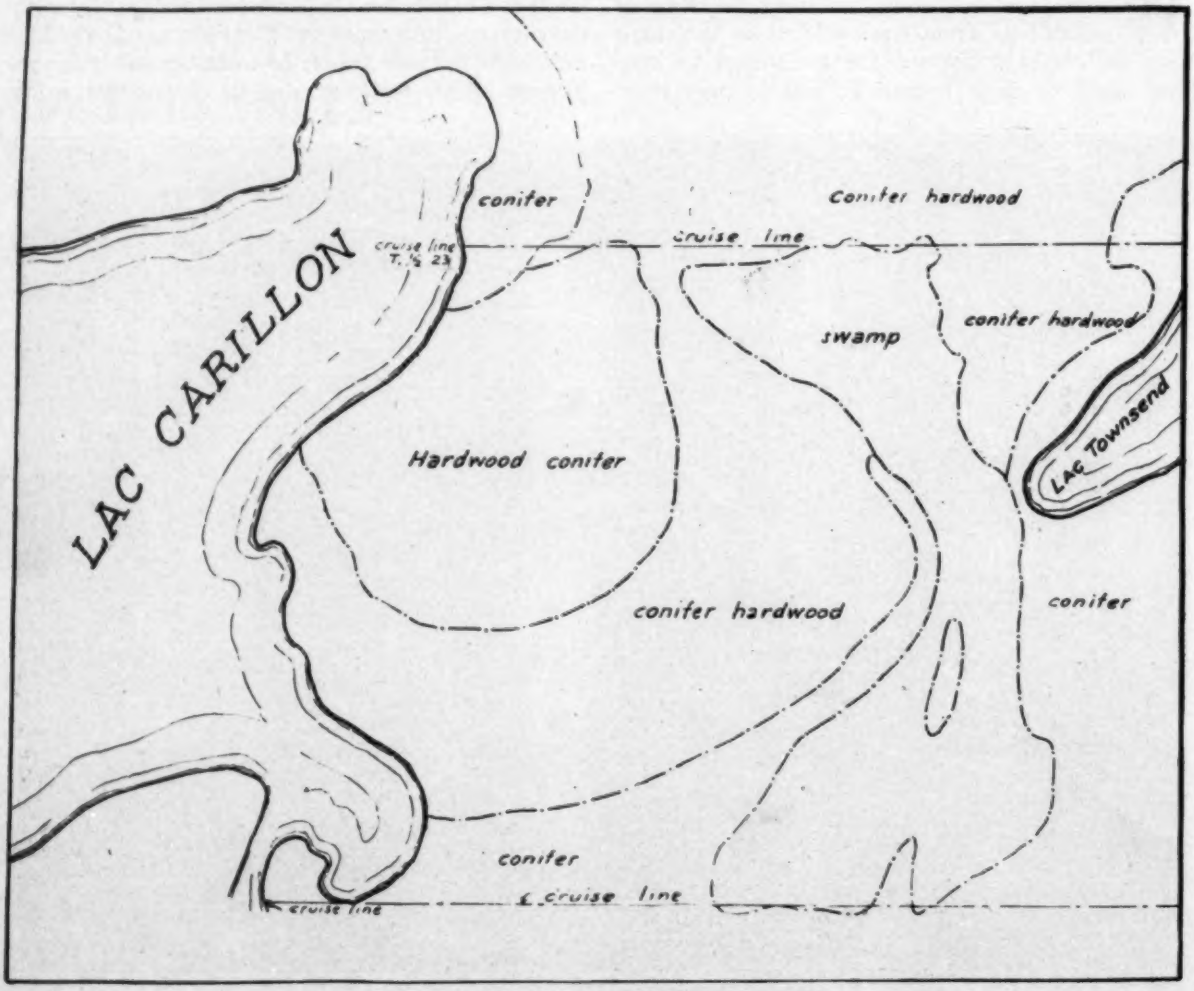

Fig. 3a—Map Made by Forester from Cruise Lines

ging operation covering even a few square miles, to the best advantage, unless he can see it spread out before him as it is on a map. All the information that many companies and holders of timberlands have about their holdings is contained in the heads of one or more woods foremen or superintendents, who often could not put their knowledge on paper if they would, and when they die the information will perish with them. A good map once made will be of value as long as the earth lasts and changing conditions such as occur through logging, fire or blowdown can easily be kept up to date by a very small expenditure.

There are several kinds of maps and it is very necessary to understand the advantages and disadvantages of each. First of all there is the sketch map (Fig. 1) made by a foreman or cruiser from memory, which is all but useless and often cannot be understood without the man who made it to explain it.

Second, there is a sketch map made from an aeroplane (Fig. 2) which shows the drainage and the burnt areas and, roughly, the timber types, but which is valueless in getting areas or accurate information, the value of which decreases as the accuracy of the ground map which is used as a base decreases. Such a map is of value in making a very rough reconnaissance for quick information such as finding out whether a tract of land is worth buying or not, or whether there is timber in a certain region. Its greatest value is in getting information as to timber conditions over very large areas or in finding out where burns are located, or for planning the mapping ahead of a more intensive survey. Such a map is made by an observer sketching from the air and unless he has a fairly accurate map already to work with, his location of lakes, streams, rivers, burnt areas or timber types may be miles out of their true position.

Third, there is the map made by a cruiser or forester by running a careful base line and from this running strips by compass and chain across the country at intervals of from one quarter to one mile apart, noting the distances from the base line to the

Fig. 3b—Same Territory from Aerial Photograph

Fig. 4a—Map from Ground Survey

Fig. 4b—Same Territory Photographed from Air

edges of lakes, timber types, burns and so on, and sketching in the outlines of lakes, swamps and burns which do not touch the cruise lines. (Figs. 3a and 3b.) Often some of the features lie parallel to and between the cruise lines and are either missed altogether or the shapes and sizes are wrongly sketched. The trees are counted and measured on either side of the strip for 16½ or 33 feet and the averages worked up and applied to areas taken from the map. Generally one to two and one-half per cent of the area is covered by the strips. The averages per acre may be fairly accurate, but the areas to which they are applied are very often wrong. The distances on either side of the cruise line are only estimated by eye and this introduces another source of error. The cost of such maps rises rapidly with the number of cruise lines run and the greater accuracy and intensity of the survey.

Fourth, there is the map made from actual surveys made by an engineer or forester in which the boundaries of all lakes, the courses of all rivers, swamps, creeks, barrens, blowdowns, burns and cut-over areas are actually surveyed and the whole carefully checked up and tied into some network of control. (Figs. 4a and 4b). This can be done at not much greater expense than the third kind and the timber types and quantities can be gotten at the time of the survey. Such a map is always useful and as the country is logged or burnt the information can be rapidly put on. Such a map serves as a base for all the other kinds and its only drawback is that it does not show the condition of the country in detail and is not always intelligible to those unaccustomed to reading maps.

Fifth, there is the photographic map (Fig. 5) made by assembling photographs taken from the air, which combines all the advantages of the others and which has superiorities over all of them. It takes but little more flying time than sketching from the air. Even without ground maps of any sort as control, it is very much more accurate. It shows all of the drainage and detail of the engineer's map and the character of every acre of the country, with all the detail of types of timber. The boundaries of these types can be much more accurately seen on the photographs than on the ground and consequently their areas more accurately determined. In eastern Canada, pure stands of timber are rare and the ordinary type map applies averages to areas which are really made up of smaller areas of quite different types. The serial photograph shows every little clump of trees and even individual trees which

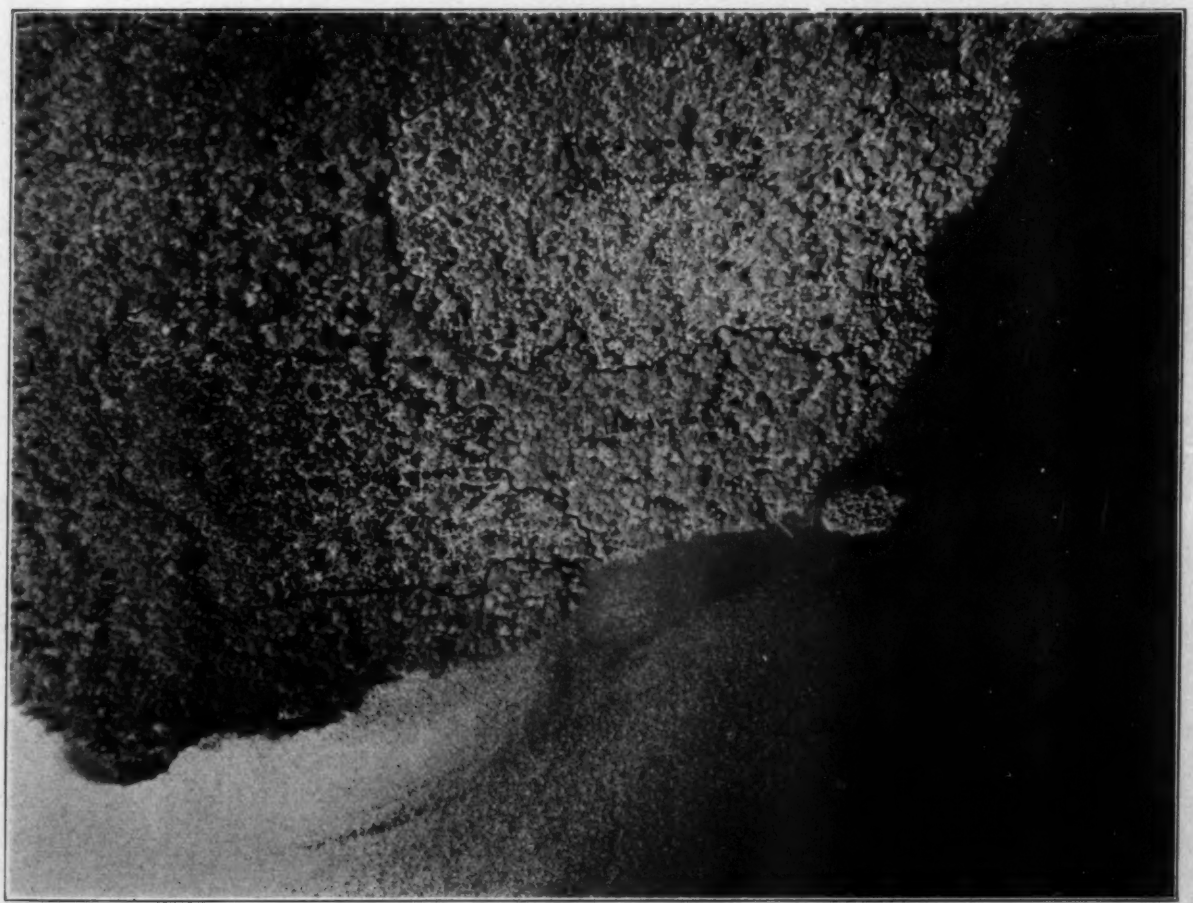

Fig. 5—Photograph from Air

come into the crown cover can be picked out and counted. White pines which, in mixed stands, usually overtop the other trees can be easily picked out and counted. The aerial photographic map gives a true type map of 100% of the area.

Once finished, all that remains to be done for an accurate timber estimate is to go to certain areas which are picked out in the office, get the diameters and heights of the trees, separate the fir and spruce, estimate the cedar, hemlock, basswood and so on and after taking the areas off the map, make up the final estimate. The actual field work is cut at least 90%.

The character of burns is shown very clearly (Fig. 6) whether everything is destroyed or the timber only burned in spots, whether the burns are reproducing or not. Blowdowns which are often in patches of a few acres and would be missed in an ordinary cruise are shown and can be totaled for a whole area. These were found in one aerial survey to amount to 2% of the whole.

The way in which logging operations have been carried on is clearly shown; (Fig. 7) large trees left uncut show up very clearly; many of the logs left on the ground show, in one picture some twenty skidways of logs left by the jobbers were discovered. Logs left in lakes or streams, along the banks or jammed in rapids can be seen and where logs are held over in booms on rivers or lakes a very close approximation to the number can be obtained by counting those in a unit area and multiplying by the total area of the boom. Roads can be roughly located direct from the maps. To sum up, all questions of laying out logging operations, from roads for provisions to bad spots for driving in rivers can be studied out and decided on by the Woodlands Manager in his office, where he has the whole country exactly as it is spread out on his desk and can use his own judgment and not depend entirely for information on some one else. The photographs are easier to read than a line map and anyone, after ten minutes of explanation, can understand them thoroughly.

As to the time required, photographs can be taken at the rate of ten to twenty square miles a day with one plane and can be developed and ready for use in a week. Made up into the finished map to scale, fifty to one hundred square miles per month can be completed, and if a timber estimate is desired the ground work will require a month to each one hundred and fifty square miles.

Fig. 6—Severe Burn

At a scale of one thousand feet to the inch, the cost of the work complete will run about eighty dollars per square mile for a minimum and without the timber estimate about sixty-five dollars, depending upon the distance from the base and the intensity of the ground work.

Another great advantage is that once the photographs are taken, extra copies to almost any scale can be made at very small cost and a few hours flying each year will keep the maps up to date.

This work has now passed the experimental stage, and over twenty-five hundred square miles of such maps are in every day use by such companies as the Laurentide, Wayagamack and James MacLaren Company. In addition, power companies are using these maps for location of transmission lines, storage areas and photographs of their plants for investors. Railroads are using them for the location of new lines and their layouts in various towns and cities. Cities are having maps made for town-planning, study of traffic problems and assessment purposes. Counties and parishes are having maps made to show location and character of taxable properties. One company is using the maps in the purchase of lands for reforestation, which does away entirely with the necessity of sending out men to examine properties and determine the areas of different kinds of land offered for sale, and thereby saves a large amount of money.

An interesting side light on this work is shown in the photographs illustrating this article which show errors discovered by the aerial photographs in all the previous types of maps described. Hardly an area has so far been covered in which some errors in previous maps have not been discovered.

No good general would think of carrying on a war without accurate maps and the woodlands manager is practically helpless, in this day of rising costs and keen competition, unless he has full information at his finger tips about the property he is operating. With good maps the directors of a company can keep in touch with their operations and can discuss questions of finance with their bankers in a much more convincing way.

Those who have used aerial photographic maps have become enthusiastic about them and it would be to the advantage of anyone operating timber lands to go thoroughly into the question of their merits and costs.

Fig. 7—Woods Depot

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Foreman Training in the Paper Industry

Introduction—Successful Training in the Paper Plant

By J. K. NOVINS

Author of "A Training Program for the Factory Foreman," "Foreman Training in Practice," "Manual of Practical Training for the Railroad Foreman," etc.

PERHAPS no other phase of efficient management has created as much attention and discussion the past four years as the matter of foreman training in the manufacturing plant, but, in the wake of this nationwide interest, forever lingers the query of the puzzled executive, "What type of foreman training should be taken on in our organization?"

Not a day goes by but this question is asked at a meeting of the plant executives in the factory, at a meeting of a trade association, at a convention, or at a consultation with an engineer or educational expert called in to solve production and personnel problems.

This series is a manual on the subject of foreman training and as such is replete with valuable suggestions for the installation of a foreman training course in the paper industry.

The series is divided into convenient installments, each completely treating some phase of the work, and will continue through twelve successive issues.

Following this introduction, the series will consist of four parts, each divided into a number of chapters. The general subject of Part One, which will begin in the November issue, is "Types of Training Programs," and will contain four chapters.

The author of this series is available through these columns to answer any inquiries regarding any phase of foreman training on which the reader might wish to be enlightened.

To this question there are always a variety of answers, but, as several solutions are often of equal interest, the questioner remains as puzzled as before he sought counsel. He is met by a thick cloud of confusion, which, as often is the case, hurries the executive into a premature decision and the adoption of a foreman training program that does not suit the needs of the particular organization and before long will prejudice the executive against the whole subject.

That this confusion should exist is only an indication of the rapid growth of the foreman training movement in this country, and perhaps can be accounted for largely by the fact that this rapid growth of a movement has been entirely out of proportion to our meagre preparation for an extensive educational program. The need for some form of foreman training was first felt during the war, when the imperative overhauling of plant organizations and the over-night training of working forces called for greater executive skill on the part of the foreman, and in view of subsequent industrial developments, combined with a new labor situation brought about by recent immigration restriction laws, the industrial outlook points to still greater efforts in the field of foreman training.

Basis for Effective Training

During his visits to many plants in various parts of the country the writer has diligently sought an answer to the question, what type of foreman training should such and such a paper products plant take on?

One way out of the confusion, the writer found, is for the executive in the paper plant to realize from the start that the first step in choosing an effective foreman instruction method is to make a thorough study of the educational needs of his organization and of the industry as a whole. The fact that a certain method of training has proven effective in John Smith's plant does not mean that it will escape failure when applied in another plant, for the conditions may differ radically in both plants.

The second factor to take into consideration is that the adoption of a particular plan is not a cure-all, and that the plant executives must be prepared to adopt a different method, even a diametrically opposed one, should conditions warrant the change.

The third factor to take full cognizance of is that **need** should stand before **method,** and that a particular method can be twisted, and perhaps several methods fused into one, to meet the needs of the particular organization. And it properly follows that any changes in methods of training brought about by the management should be timely changes, and not brought about after the damage has been done.

In these articles, to be published serially, the reader will find a description of every type of foreman training developed in plants manufacturing paper and paper products. The writer has had an unusually good opportunity to study the foreman training methods in the paper industry. Since the foreman training problems are similar in plants manufacturing paper products, such as the Dennison Manufacturing Company and the A. M. Collins Man-

ufacturing Company, and in plants manufacturing the raw paper product, such as the Champion Coated Paper Company and the Gardner and Harvey Company, the writer has properly drawn from the experiences of both these types of plants. This method serves the purpose of making this series of articles a complete practical manual of foreman training in the paper products plant as well as in the entire paper industry.

Types of Programs in Paper Plants

The first four articles of this series, comprising Part One, deal with the development of various types of foreman training in the paper industry. The first article takes up in detail the development of the foreman training program in the Dennison Manufacturing Company plant at Framingham, Mass. This company bears an international reputation for enterprise in industrial relations work, and its experiences with the training of foremen ought to be of special interest right now. For kind assistance in the preparation of the article the writer is indebted to Mr. T. G. Portmore, Manager of Works. After the preparation of this article the facts and manner of treatment were checked up by Mr. Portmore, thus vouching for its accuracy. In the same spirit the writer prepared the other articles, carefully checking up facts and recording observations from first hand investigation rather than from second hand sources.

The second article in the series deals with the development of a lecture study course, and this article, in a measure, supplements the article on the Dennison plan, as it points to various methods of making a lecture study course effective as well as interesting to the foremen. Most of this second article deals with a lecture study course developed for foremen employes in such plants as the A. M. Collins Manufacturing Company, Jesse Jones Paper Box Company and the United States Paper Box Company, all of these firms being located in Philadelphia, Pa. The writer spent several months in this city studying foreman training methods developed in plants.

The conference method of foreman training, developed by the government in various industrial plants, is treated in detail in the third article. To get a full measure of the results achieved by the conference method, the writer personally observed the conference discussion in several plants. He attended an interesting conference discussion by foremen at the Champion Coated Paper Company at Hamilton, Ohio. In this connection the writer wishes to express gratitude for the kind assistance offered him by Mr. R. W. Jenkins, of Hamilton, Ohio, an expert on foreman training in the paper industry, and to Dr. Louis H. Frechtling, Director of Industrial Relations of the Champion Coated Paper Company. Both these men lent their sincere assistance to the writer during a visit to the paper center in Hamilton, Ohio. Dr. Frechtling is an ardent enthusiast of foreman training and has done a great deal to spread the interest among the executives of other plants in the paper industry.

One concern in the middle west spent four years developing a foreman training program for its foremen. It is a distinct type of training, and embodies so many advantages that the writer visited the plant, where he talked to the executives and foremen. In the fourth article of the series, entitled, "The Organized Group-Discussion Plan," the writer describes the development and operation of this method in such a concise and constructive manner that no executive will find it difficult, after a reading of the article, to install the same training feature in his own plant.

How to Develop Program

Part II of this series, comprising Articles 5, 6, 7, 8 and 9, deals exclusively with the methods of planning and conducting training programs for foremen. The problem of developing executives to handle the training in the plant—a most important problem—is handled in the fifth article. The methods of developing foreman training leaders are taken up and discussed, from the experiences of a number of plants in the paper industry, followed by a recital of the program developed by the federal government with the co-operation of various states and educational institutions.

The sixth article will give the readers a comprehensive idea how the training leader works—how he formulates the training plan, how he interests the foremen and the plant's higher executives, how he gathers material for the training course, and the ways and means employed by him to conduct the conferences with the foremen.

The actual organization of the foremen's conference is covered in the seventh article. Such details are covered as, the time the sessions are held, where they are held, what types of foremen are invited to the conferences, and, chiefly, how the management co-operates to make the conference a success.

Article eight and nine take up two important phases of successful foreman training. First, how the management secures the foremen's co-operation to make such training a success from the start. In this article the writer draws upon the experience of leading concerns, only the best methods being presented. Second, how the management can properly co-operate to make the training a success. Foreman training leaders fully realize that these two factors often decide the success or failure of a foreman training program.

Foreman Training Pedagogy

The training methods ordinarily in use in a night school class, in a college class room, or in a class for

apprentices in a factory, will not do with a group of mature-minded factory foremen. A special method must be used, a method designed to interest and appeal to foremen. Foremen are experts of their jobs, and they will resent plainly any sort of training that does not help them get to the bottom of factory problems. Therefore, a distinct pedagogy of foreman training has been developed during the past few years. The highest salaried educational experts have been engaged in the work. They have developed a unique pedagogy that appeals strongly to foremen.

What this pedagogy is, and how to use it in conducting training in any plant, is completely outlined in the fourth part of the series, comprising Articles 10, 11, 12, 13, 14, 15, 16, 17. In these articles the writer does not simply outline the pedagogy itself, but he develops the principles by giving the practical applications during the foremen's conferences actually conducted in paper plants. By reading these articles and giving the subject further thought, the factory executive can lead a foremen's conference and get profitable reactions from the foremen. The subjects treated in these articles will furnish the meat for a complete series of foremen's conferences.

Articles 10 and 11 deal with the important subject of job analysis, and are copiously illustrated with actual job analyses developed at conferences of foremen in plants manufacturing paper products. Article 12 shows how the foremen discuss the subject of instructing the worker on the job—the principles of job instruction are carefully explained and illustrated with sample job instructions performed by the foremen during the conference. Article 13 is interesting in that it develops an analysis of the foreman's job—his responsibilities, and the importance of each responsibility in relation to the general efficiency of the entire plant organization. The methods used by foremen in handling their men are discussed in Article 14. The next article takes up safety problems, showing how foremen actually analyze and solve safety problems in their plants. Orders, directions and suggestions are considered in Article 16. Article 17 is devoted to a discussion, showing how foremen in one paper plant analyze and solve a production problem. In this article is given the formula used for analysis of a production problem, and proceeds with a description of each step in the solution of the problem.

Government Helps Paper Plant

In various states throughout the union foreman training has now become a recognized state function. The various state educational agencies have planned, and are carrying out, foreman training programs to serve various industries in the state. Here is a grand opportunity for the executive of the paper plant who desires to initiate foreman training in his plant. The state educational authorities will help him. They will send men to the plant to start the training, and to organize it in such shape that it can easily be continued by the plant itself. And this service is entirely free; there are no strings attached to the proposition.

But the plant executive often is unaware of the existence of such agencies in his state. Part IV of this series, which completes this manual, contains seven articles. These articles describe the foreman training programs developed in the following states: Indiana, Ohio, Wisconsin, Michigan, New York, Massachusetts, New Jersey, Rhode Island, Pennsylvania, Iowa, Utah, Colorado, Washington, Idaho, Nebraska, North Carolina, Maryland, Tennessee, Kentucky, Virginia, Texas, West Virginia, Mississippi, Alabama, New Mexico, Georgia, and Florida.

In some of these states paper industries have taken advantage of the facilities afforded by the state educational agencies. For instance, in Indiana foremen from the Sefton Manufacturing Corporation have been trained by state officers. In Wisconsin, where a comprehensive state foreman training has been developed, foremen from the Tuttle Press have thus been trained. In Ohio a number of plants have conducted foremen's conferences organized by the state officers.

Any of the readers who are interested in developing foremen training can secure valuable free assistance from the state officers. In the articles in the fourth part of the manual they will learn just what facilities exist in their particular territories.

An interesting incident recently occurred in a paper plant in the middle west. The executives of the plant had secured the co-operation of the state educational department to develop a program of foreman training. The state department sent an experienced man to conduct a series of weekly conferences with the foremen. The plant management was fully satisfied with the results, and requested that the state continue the work the following year. The state officer complied with the request.

One day a man, who described himself as the representative of a newly organized commercial educational institution, called on the personnel manager of the concern. The salesman described an extensive system of foremen training developed by his concern. He produced papers showing the nature of the course and methods of instruction. These the executive examined, and immediately convinced himself that the plan was not superior to the one developed by the state officer. Through sheer curiosity, the executive simulated interest and requested a statement of terms.

"We will put on a system of foreman training in your plant for $85,000," the salesman said.

"Eighty-five thousand dollars!" echoed the executive. "We have developed an efficient training pro-

gram here which, if not superior to yours, is just as good, and it has not cost us a cent."

This incident is not an exaggeration. It is reproduced exactly the way it was related by the executive concerned. It illustrates a serious condition. There are many facilities to help the industry train its foremen; the service is free; the plant executives should take advantage of the service.

The writer in no manner desires to minimize the importance of foreman training offered by commercial educational organizations, such as correspondence schools. They perform a valuable service. Their work is praised by executives of nationally known concerns and by educational officials. The importance of correspondence study is increasing every day.

But the point the writer wishes to make is this: Every form of training has its good points. Therefore, he has enumerated the different types of training, described the methods employed, and there he considers his task done. The rest is for the factory management to consider. The writer has no connection with any system of training. He has studied all systems, with an open mind, as an observer, with one idea in mind: to pass on the information correctly to our readers.

Waste in the Pulp & Paper Industry

By B. T. McBAIN
A Vice-President of Superintendents' Assn.

THERE are economies and false economies. There are also wastes and false wastes. Let's see.

So many superintendents are trying to save woolen felt costs by making their felts last longer. This may and may not be a saving.

If on a paper machine, the life of woolen felts can be lengthened by use of rubber or even brass felt rolls. Greater life can be gotten by reducing the number of rolls in the press part. Some mills have 10 to 14 rolls where 6 might do the trick. Each roll has a wearing effect.

However, when the paper maker begins taking weights off his presses to increase the life of woolen felts, he may be saving a quarter and losing a dollar, for each per cent of water removed from the paper at the presses saves many dollars of steam in drying.

Many mills are using very soft press rolls, claiming better results, fewer breaks, dryer paper and longer life of felts. If all these things really happen it is a wonderful thing.

I am for soft rubber rolls and always have been, but there is a point in softness where the saving in felts and in other things is overbalanced by the increase in steam consumed per ton of paper dried at the dryers.

Some mills use suction boxes on the felts, others do not. Some claim longer life of felts without the box because of less wear, while others claim the suction box keeps the felt in better shape and more paper is made and dried to far offset any wear.

I have known foremen to remove the whipper on pulp wet machines and get better and longer life, as well as greatly increased production per felt, while the foreman in the next room couldn't get the pulp over the machine unless he had the whipper.

Another claimed wooden top and rubber bottom press rolls the only thing for groundwood wet machine, while in the next mill iron rolls, both top and bottom, were in use and as good felt life experienced.

In the case of a Yankee machine with an 80-foot top felt and $1,000 nearly every 3 weeks paid for a new one, the superintendent changed the length to about 40 feet, cut the cost to $500, removed half the felt rolls, and the felt ran longer.

Now, take a dryer felt that is run without any dryer felt dryers. It is run damp, and the loss in life of felt and increased steam to dry the paper is greater each month than the cost of equipping the machine with dryer felt dryers, unless the paper run is so arranged so it skips enough dryers so the felt is kept in condition.

American dryer felt makers should adopt the asbestos felt. It costs too much and it is not right to kick about importing pulp and paper, and then import dryer felts for our own paper machines. But the cost is warranted. Our experience shows this to be a fact, but in case of an accident the savings in cost will go to the bad.

This is a big subject; every mill has its pet ways of doing things.

The wire parts of many new machines are much heavier than formerly, and some machines are using 100 ft. wires. I guess I was as much to blame as anyone for using a 100 ft. wire on a 1,000 ft. news machine, but later machines are doing better and making better paper with 80 ft. wires.

Wire life can be increased by removing wire carrying rolls and reducing the "belt" work the wire must perform. James O'Hara, superintendent at Lebanon, Ore., has invented a new method of tightening the wire so only the breast guide and couch rolls are used in addition to tube or table rolls.

He has doubled the life of his wires. It is being tried at Nepco mills in a measure and so far with good results.

Wood Preparing Equipment

By HARRY E. WESTON

Assistant Professor of Pulp and Paper Manufacture, The New York State College of Forestry, Syracuse, N. Y.

This is the seventh installment of Mr. Weston's article on Wood Preparing Equipment. The series will conclude with the next issue of this magazine.

Chip Screens

CHIPS, as they are discharged from the chipper, contain from about 1 to 5 per cent of sawdust and approximately 1½ to 3 per cent of slivers. The amount of sawdust and slivers present can be largely predetermined by the methods used in operating the chipper. Such material should be removed from the chips in order that the best results may be obtained in the cooking process.

It was formerly thought that sawdust would not cook in the digester and would, therefore, prevent proper circulation of the cooking liquor. Poor circulation would certainly be caused by an excessive amount of sawdust, but not by the amounts usually found in common mill practice. However, sawdust will give a lower yield and poorer quality of fibre than that obtained from chips of proper size and should, therefore, be removed along with the slivers. The absorptive power of the so-called standard chip is so different from that of slivers and oversize chips that raw or under-cooked pulp would result from them if they were not removed before the cooking operation.

In order that the undesirable material may be removed economically, chip screens are employed. A number of different designs are in use, but all may be classified in one of two types, namely—Rotary or Reciprocating. The latter is frequently designated as "Shaker."

The rotary screen may be built as a single or double cylinder (one cylinder being placed inside another) and is usually constructed in sections.

One of the early types of revolving chip screens consists primarily of a fine sawdust section and a section in which the oversize chips and slivers are removed. Either section may be made up of a number of individual unit-sections so that the size of the screen can be varied to suit the capacity of the installation. The first or fine sawdust section is made of perforated metal with openings that will permit the passage of the sawdust and finer waste particles during the operation of the screen. The chips, slivers, etc., are carried from this section into the second section where the good material is removed and the slivers and oversize rejections carried to the end of the screen where they are discharged. The second section is fitted with specially designed slats between which the standard sized chips pass and thus may be separated from the material which should be rejected. Oftentimes, however, long narrow slivers stand on end and pass thru the slats along with the standard chips and cause trouble in cooking.

Another screen of the single cylinder type has been designed to be used in conjunction with the shaker or reciprocating screen. While a screen 6 feet by 20 feet is considered a standard, one may be built in different diameters and lengths to meet individual requirements. The framework of the cylinder consists of two end rings and three intermediate or traction rings which are connected by heavy flat steel bars. The wire screen is fastened to the inside of the frame by the use of flat steel strips and cap screws. On the inside of the cylinder are lifting or conveying strips which not only lift the chips but also carry them toward the tail end of the machine, avoiding the necessity of placing it at a large angle of inclination.

Courtesy Waterous Engine Works Co., Ltd.

Receiving chip screen used in conjunction with reciprocating screen

The cylinder rests on traction wheels carried by two shafts which are driven by two pairs of bevel gears from a countershaft. As these traction shafts rotate they impart the rotation to the cylinder.

The accompanying illustration clearly indicates the details of this type of screen.

There are several different makes of chip screens of the double cylinder revolving type varying primarily in details of construction. As in the case of the single cylinder screens they are built in a number of sections—usually from three to six, with the

capacity increasing as the number of sections are increased. The number of sections in any particular screen installation would, therefore, be determined by the capacity of the mill. A three section chip screen of this type will ordinarily handle from 40 to 80 cords of wood per 10 hours while a six section screen will handle from 125 to 150 cords.

The machine consists of two cylinders (one inside the other) built upon cast iron rings and supported on traction rings by two shafts which bear traction wheels. The outside cylinder is approximately two feet larger in diameter than the inside cylinder and both cylinders are tapered. The intake end on the inner screen of one of this type is approximately four feet in diameter, while the discharge end, which extends beyond the outside screen, is slightly over six feet. The outer screen at the small end is about six feet and the large end eight feet.

The inner screen may be made up or covered with perforated steel plate or wire cloth. The size of the openings would be varied to suit the size of the standard chips desired after screening. One mesh wire is frequently used for covering the inner screen.

The outer screen or cylinder is built up with wire cloth. A standard covering made of $\frac{1}{16}$ inch wire spaced about $\frac{3}{16}$ inch centers is used on one make of screen.

Traction rings are located around the outside cylinder and permit the completed cylinder to rest on traction wheels carried by two shafts. The traction wheels are often placed with the flanges on the lower side of the traction rings, so that each flange aids in supporting a part of the trust. An adjustable bracket with thrust roller is located at the lower end and at each side of the cylinder for additional support to the revolving screen against thrust. The end traction ring runs against the wheels on these brackets. Such thrust bearings, as well as traction wheels and traction rings are illustrated in the picture showing compound revolving chip screen. The drive shaft, located at the upper end of the chip screen, carries two bevel gears to mate the trunnion gears, and the main drive pulley which can be belt connected to any suitable source of power. Ten to fifteen H. P. are required to operate the ordinary screen of this type—the power varying according to the size of the screen. The R. P. M. of such a screen is about 20 to 30 depending somewhat on local conditions and individual preference.

For the successful operation of a screen of this kind, it is necessary to have a stiff and strong foundation to support the trunnions, which carry the cylinder and the drive shaft. This foundation is generally of wood construction and is built, under the direction of the chip screen manufacturers, by the mill in which the screen is placed.

A screen of the reciprocating or "shaker" type is shown in the accompanying illustration. Such a unit consists essentially of two strongly built reciprocating screen tables flexibly supported from a rigid structural steel or timber frame. The frame must be solidly built. Georgia pine, fir, or any other suitable structural timber might be used in the construction of the frame, if of wood, while structural steel angles are commonly employed in the construction of the metal frames. In many cases, particularly with timber construction, the framework is strengthened by means of stay rods which are usually adjustable. The metal frames are often braced with angle irons, as can be noted in the previously mentioned cut.

Various methods are used to support the two reciprocating tables located one above the other within the frame and inclined at about 8° to the horizontal. Sometimes hickory hangers attached to the steel framework are also attached to the tables and in this way support them. Six hangers (three on either side of the screen) are used for each table. In other instances iron rods support the tables. Supporting rods and their method of attachment to the frame and to the tables may be seen in the cut showing reciprocating chip screen. Other methods for supporting the tables are also in use.

The tables or screens proper may be of all-steel or a combination of wood and steel construction. The bottom of the top table or tray is covered with perforated metal plate. The perforated openings may be oblong—approximately 1x2 inches or oval—about $\frac{3}{4}$"x1$\frac{1}{2}$". One make of screen has forty-eight $\frac{3}{4}$"x 1$\frac{1}{2}$" oval holes per square foot of area. The bottom of the lower table is provided with a perforated metal or wire screen. The size of the openings in this screen should allow only the dirt and sawdust to pass through. Screens perforated with $\frac{1}{8}$", $\frac{5}{32}$", $\frac{3}{16}$", or $\frac{1}{4}$" round holes or number 5 mesh wire may be used for this purpose. Perforations of $\frac{5}{32}$" dimension are regarded as standard with some manufacturers.

These tables are driven by means of eccentrics which give to them a shaking or reciprocating motion. Noise and racking of the frames is reduced by having the tables moving simultaneously in opposite directions. This is generally arranged by placing four driving eccentrics (two for each table) in opposition. Oftentimes the driving pulley is of sufficient weight to aid in making a smooth running machine by acting as a balance wheel. The eccentrics are sometimes placed along the sides of the tables at approximately the center instead of on the ends as described. The drive shaft is operated at a speed of 175 to 225 R. P. M. while the power consumption may vary from 3 to 10 H. P.

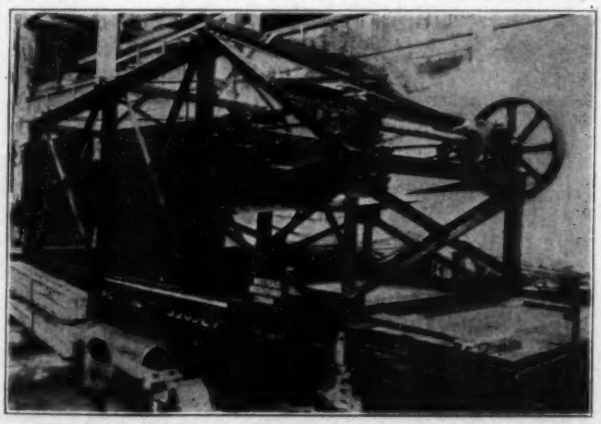
The capacity of reciprocating screens may range with different types under proper operating conditions from approximately 75 to 200 cords per ten hours. A table developed from data received from one manufacturer is as follows:

Size of Tables	Capacity in Cords per 10 Hours
48″x18′0″	100
60″x18′0″	125
72″x18′0″	150
72″x25′0″	200

The chips are delivered to the upper end of the top table and while passing over it, due to the incline and motion, the uniformly sized chips and sawdust drop thru the openings in the bottom and the oversize material is carried along to the end of the table. Here it may be hoppered into a chute that guides it to a conveyor which delivers it to a crusher or rechipper, depending upon the practice in the individual plant. The sawdust is removed thru the openings in the bottom screen to a conveyor located directly beneath it by which it is removed from the screen. The uniform chips, comparatively free from sawdust, dirt, undersized, and oversized material work toward and off the lower end of the bottom table. The screen is generally so arranged that the chips fall from the lower end of the bottom table upon a conveyor which carries them toward or to the chip bins.

A comparatively recent but radical change in the design of reciprocating chip screens is illustrated in the screen shown in the accompanying illustration. This screen of all-steel construction was designed to handle a maximum flow of chips from an individual chipper of any size operating under normal conditions and cutting chips five-eighths of an inch in length.

The screen, as illustrated, does not show some of the more recent improvements in design although the fundamental design of the machine remains unchanged. As in the older types of reciprocating



Courtesy Waterous Engine Works Co., Ltd.

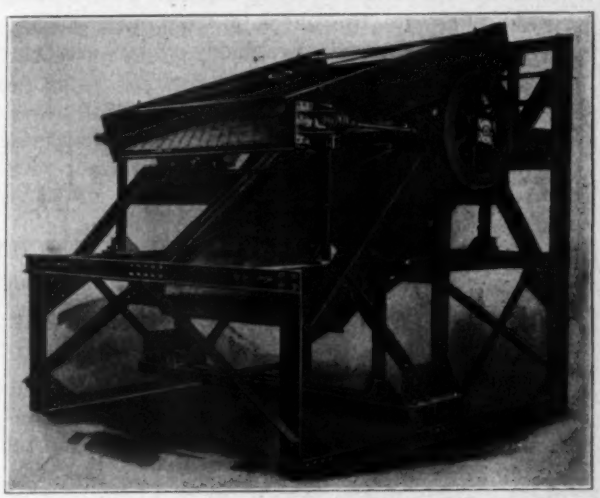
Steel frame reciprocating chip screen

screens, this screen consists of two tables, equipped with screening surfaces which are supported in such a way within a suitable framework that a reciprocating motion can be imparted to them.

The framework is of standard sections that are riveted and assembled with bolts. Details of the frame are shown in the previously mentioned cut.

The two tables of the screen are of structural steel with screening surfaces of wire cloth which are carried in the tables by means of light steel grids. Both tables are supported by hinged struts mounted at each end in Hyatt roller bearings.

The top table carries one screening surface, in which the table is divided horizontally into three sections of approximately equal size. The wire cloth is



Courtesy Rythor & Pringle Co.

Reciprocating chip screen

placed so as to form a cascade or step for each section. This insures frequent change in position of the chips and consequent separation of sawdust and oversize material. The openings in the wire cloth on the top table are graduated in size so as to allow all chips measuring less than 1½ inches x 1 inch to pass to the lower table. The size of the openings decreases toward the front end of the screen in the direction of the general movement of the chips to prevent the up-ending and passage of slivers thru the wire cloth as the chips progress along the table. The large knots, cards and slivers are rejected over the end of the table, from which they are generally conveyed to a crusher for reduction.

The bottom table is arranged in a somewhat similar manner, except that it has two screening surfaces, the upper of which is cascaded every eight inches. The arrangement of these steps is shown in the diagram illustrating the screen. The openings in the top cloth of the lower table serve to reject immediately all undersized chips with the accompanying dirt and sawdust, while the main flow of normal chips one-half inch and over is delivered from the lower end of the cloth to a conveyor leading to the storage bins.

The volume of undersized chips, dirt and sawdust deposited on the lower plate of the botttom table is comparatively small and lends itself readily to separation thru the openings in the lower plate, which

serve to reject particles an eighth of an inch square and under. The chips retained on the cloth are delivered over the end of the table and may be conveyed along with the chips of standard size to the chip bins or may be segregated for separate cooking.

The screen tables are operated with comparatively small vibration by means of Timken roller bearing eccentrics mounted on the drive shaft, opposed at one hundred and eighty degrees, and connected with the tables thru rods provided with resilient connections at the table ends. These resilient connections serve to eliminate the shock of the reciprocating movement and to impart a peculiarly effective screening motion to the tables.

The drive shaft, arranged across the machine between the top and bottom tables, is mounted in universal Timken roller bearings to insure constant alignment. The drive wheel is attached near one end of the shaft, while a flywheel is provided for the opposite end. Construction is such that these parts may be interchanged to permit driving from the more convenient side of the machine. The machine requires approximately 3 H. P. for operation and is driven at a speed of 275 to 350 R. P. M., depending upon existing mill conditions.

Chips must be properly delivered to the distributing chute at the head end of the screen so that they may be spread evenly over the entire width of the top table, and thus be placed in position for uniform screening.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Steam Meters Save $6,000 a Year

I HAVE before me a report regarding the installation of 16 steam meters in a large paper plant in which it is claimed that the meters pay for themselves annually by salvaging exhaust steam and by effecting other economies.

This paper company has a daily production of 135 tons of high grade paper. Their power cost runs into several thousands of dollars per day, being from 40 to 47 per cent of the total production cost. Therefore, as the report states, "the generation and use of steam are entitled to almost as much study as all of the other plant operations put together."

The power plant consumes an average of 100 tons of coal screenings per day and 6 car loads of "hog feed" or wood chips from the saw mill. Eleven flow meters were installed in 1919, and now they have 16 in operation. There are 11 on the boilers, one on the distribution line to the digester, one on the line to the big engine, one on the line to the bleaching plant, and one each on the 10-inch and 8-inch lines supplying several machines.

One of the interesting statements in the report is this: "A study made possible by our meters determined that exhaust steam from our 1,000 K. V. A. engine could be used on our bleaching machines in the place of live steam. On this item alone we saved in one year more than $6,000 which repaid the entire cost of our meters."

Follow Directions

MANUFACTURERS are generally very careful about sending instructions with their product in order that there will be no failure in operation and in order that the product itself will not be ruined because of unintelligent application.

The writer knows of an instance where the manufacturer always writes a personal letter to the engineer in addition to the printed instructions that accompany his product, yet, in spite of these precautions he finds his product installed in the WRONG way time and again.

One engineer actually felt **insulted** by this manufacturer because of the sending of the detailed instructions. He was very cold to the salesman when the salesman appeared on the premises again and said rather loftily, "Don't you suppose I know how to do the simple little jobs around this plant after 20 years' experience without being told in schoolboy fashion?" The salesman had to apologize, of course, but he explained that the same thing is done in every case and for reasons that he made obvious to the engineer. In a short time the engineer warmed up and didn't feel so badly about it.

One of the bad habits of most of us is to unpack a thing hurriedly and throw the instructions away with the packing. We comment to ourselves, "That's just advertising stuff and I know all about it already."

Things are done differently right along, however, and they are done **better** this year than last. Next year they will be done better than this year. The year after that there will be still further improvements, and so on. It therefore behooves us to be careful about throwing printed matter of this kind away. Always look it over with care, at least, even though you don't read it. Be sure that you are acquainted with the "latest and best" method of applying the part or product, no matter how simple it may seem.

There was a time when I thought I knew how to cut a belt, for instance, in such a way that when laced it would be perfectly straight. I therefore scoffed at articles that contained such simple information as "Use a square for cutting the belt abso-

lutely at right angles," etc. Why do they print such simple stuff, I thought to myself. I thought that was the only way in the world in which it could be done and everybody knew it anyway.

One day, though, I saw an old hand at the belt game cut a belt through at an "angle." He laid one on top of the other and cut them both at once. They were therefore identical in angle. Instead of a square, all he needed was a straight-edge. And his fit was "perfect." My eyes opened and from that time on I have maintained that we **don't** know it all and never will. I don't scoff any more when I read simple articles and see simple directions sent out.

Thousands of dollars worth of machinery and accessories are ruined every day because of misapplication. The reason for the misapplication is the "know-it-all" spirit in which too many of us receive shipments and install them.

Tomorrow, very likely, we will turn around and carelessly throw away directions in the same old way without thinking. It is done mechanically. It is a habit. But it is a bad habit.

Blow-Off Pipe Losses

THIS is a loss that is seldom written about because it is usually considered a very small matter and because it is a loss that is hard to detect. Blow-off pipes are generally so arranged that the end of the pipe cannot be seen and the engineer therefore does not know whether or not a leak exists through the blow-off valve. Besides even where the end of the pipe is visible water is seldom seen dripping out because the high temperature of the water in the boiler is sufficient to convert most of the water into steam before it reaches the atmosphere. The leak therefore doesn't look serious and the engineer "lets 'er go."

However, it is a fact that the blow-off valve often becomes leaky because it has so much of a "hard row to hoe" due to the scale and mud that are so frequently blown through. Few valves can stand such torture long without showing signs of distress. Then, when a leak begins, it must be remembered that the hot water is forced through with tremendous pressure from the boiler and the quantity of water forced through often assumes large proportions. It is not difficult to compute the weight of water that may be lost in this way where the area of the leak and the boiler pressure are known. Ordinary hydraulic formulas will give the result with reasonable accuracy. Then, knowing the weight lost, it is a simple matter again to determine the heat and the proportion of the coal pile that is lost through the blow-off valve.

In case the engineer or anybody else connected with the paper mill wishes to test out the blow-off pipe, here is a method that will give good results with strictly home-made equipment.

Put a barrel or other large watertight vessel on a pair of scales and fill it about three-fourths full of water. Next, run the blow-off pipe into the barrel or tank as shown in the sketch so that the end of the pipe will be well submerged in the water. All water that leaks through the valve will therefore be caught in the barrel, and all steam generated due to the heat in the water will be condensed in the water in the barrel. All one needs do, then, is to weigh the barrel of water at intervals of an hour, say, and in that way determine the exact weight of water that leaks through per hour.

If you wish to go further, now, and compute the percentage of the coal pile that leaks through the blow-off valve here is a formula that will do it. The formula contains factors that can be determined from observations made by any engineer of intelligence.

$$\text{Per cent of coal pile lost} = \frac{100\,W(T-t)}{CH}$$

Where W = the weight of water leaking through the blow-off valve per hour;

T = the temperature of the water in the boiler in degrees F.;

t = the temperature of the water before being heated at all, as it comes from the city mains, from the private well, from the river, or other source of supply.

C = the weight of coal fired per hour, pounds;

H = the heat value of the coal, B. t. u.

For example, if it is found in any plant that W is 100 pounds, T is 310 degrees F., t is 70 degrees F., C is 500 pounds, and H is 10,000 B. t. u., substituting in the formula we get:

$$\frac{100\times100(310-70)}{500\times10{,}000} = 0.48 \text{ per cent}$$

In other words, 48 ten-thousandths of the money spent per year for coal is wasted through the blow-off valve. Thus if your mill operates 10 hours per day and 300 days per year the total number of tons burned per year is:

$$\frac{500\times10\times300}{2{,}000} = 750 \text{ tons}$$

At $6.00 per ton this amounts to $4,500 per year and the yearly cost of the leak through the blow-off pipe would therefore be

$$\$4{,}500\times0.0048 = \$21.50$$

This amount may not look like much, but why not save it? Maybe your yearly loss is much more. It certainly will do no harm to test your blow-off valve in a manner similar to that described here, and if there is any loss at all determine the yearly money loss.

Can Waste Be Economical?

WE SOMETIMES hear the statement or read it in print that where fuel is cheap it does not make much difference whether or not the steam boiler and steam engines are efficient—that the fuel doesn't cost anything anyway.

This, however, is a fallacy that is worthy of considerable thought.

In the coal fields for example, where coal costs very little, it is evident that it is more economical to operate a single boiler whose efficiency is 80 per cent than to operate two boilers having the same initial cost at 40 per cent efficiency each. It would require two boilers and twice as much coal to do the work of a single boiler kept clean having an efficiency of 80 per cent. Not only would two boilers have to be purchased in the first place but they would require twice as much floor space, twice as large a building, additional piping, the cost of labor for shoveling the coal would be greater, taxes would be greater, depreciation greater, etc. The fact that coal costs nothing in the coal district is therefore no good reason why one can afford to waste it.

In the same way an engine of high efficiency will do more work than an engine of low efficiency. It generally pays to keep efficiency high.

There is plenty of free harnessable energy all around us that we can have for nothing if we want it, that is, if we can obtain the necessary machines for doing the harnessing for nothing. The wind, for instance, contains considerable power and "all that is necessary" to harness it is to build a windmill, put in generators, storage batteries, and so forth. The same is true of the tides and of sun power. However, the first cost of the equipment for doing this harnessing is so high that we usually find it more economical to purchase fuel and use machinery that has a lower first cost per horse-power developed.

Regarding a Boiler Explosion

NOT long ago I read an account of a boiler explosion which was given considerable space in engineering magazines. I was struck at the time with the conflicting ideas, notions, or imaginations regarding the explosion put in print by some of the writers and I proceeded to call some of the points to the attention of engineers.

Two boilers exploded: a boiler that I will call "A," made by one manufacturer, and a boiler that I will call "B," made by another manufacturer. Each manufacturer tried to escape the responsibility of the explosion. Here is a portion of what I wrote:

"A study of the reports already printed in ..... tend to convince the writer that it was the 'A' boiler that exploded first primarily because of its weakened condition. It had grown constantly weaker through corrosion and was not 'bolstered up' as was the 'B' boiler. Mr. ..... states that the 'B' boiler had been repaired a number of times and that the repairs had been called to the attention of the insurance company. That much of it is favorable to the 'B' boiler.

"Stay bolts are made hollow purposely in order that any defect in the bolt will immediately manifest itself. This is common practice in locomotive boilers and replacements in such boilers are common. These replacements have never, to the knowledge of the writer, culminated in an explosion.

"The fact that the 'A' boiler head was indented would tend to prove that in its violent movement it struck something—possibly the 'B' boiler. It is as possible for a head to become indented by striking a hard object as it is when struck. This does not prove which exploded first. Here, however, is a paragraph which makes the case unfavorable to the 'A' boiler.

> "'Inasmuch as an indentation in the head of No. 6 "A" boiler was found after the explosion and as the head itself was found practically at the same point where the mud drum of this boiler landed, it would seem that this head was knocked out and not blown out.'"

"It appears that the mud drum 'sky rocketed' or moved, and the head went with it. In this motion the head may have struck the 'B' boiler. Anyway, they both 'landed together.' If the head had been 'knocked off' as Mr. ..... thinks, then the drum and head would possibly have gone in opposite directions.

"The chief fireman stated that he 'heard a cracking noise which he said sounded like the tearing of metal.' To the writer this sounds absurd as metal makes no noise when it tears. Tear a piece of paper or cloth or other fibrous material and it will make a noise but when you tear a non-fibrous material such as lead foil, tin foil, gold foil, celluloid, etc., it is practically noiseless. Certainly, the noise that was made by the escaping steam rendered inaudible any tearing or ripping off of rivets. Possibly after the steam had all escaped the tumbling bricks, etc., could be heard but in the opinion of the writer the preceding events would so far overshadow the mere tumbling of walls that an onlooker would hardly know 'what happened when'."

Just what was decided by the "powers that be" regarding the cause of this explosion, and which boiler exploded first, I have never learned.

Life is too short to be unhappy in business. If business were not a part of the joy of living, we might almost say that we have no right to live, because it is a pretty poor man who cannot get into the line for which he is fitted.—George Lippincott Brown.

A filthy mind unfits a man for promotion, says the National Safety Council.

Cost and Factory Accounting—Part VII

By H. M. GRASSELT

American Writing Paper Company

THE COST details that are entered into the Beater Report to Production Order (Fig. 7) constitute the foundation for the subsequent determination of the manufacturing cost of a run made on a certain production order.

In a cost system, as in any other constructive undertaking, the foundation must be sound; that means the cost information is to be assembled on an absolutely correct basis and must, of necessity, be free from uncertainties and guesswork.

Since the beater engineer enters the initial cost data into the beater report, it becomes of supreme importance that he is thoroughly acquainted with the nature and purpose of this work. He must understand that a slip-shod method will not do, neither here nor in his practical work. In consciously carrying out the work of assembling cost details in the beater furnish sheets, the beater engineer has an opportunity to execute co-operation in the highest sense of the word. It is here, where a thorough understanding of the underlying factors of costs and their important relations to economical production and resultant prosperity of the enterprise, helps to solve one of the many industrial problems—that of obtaining dependable cost information.

The beater engineer, who has the welfare of his company at heart and thinks beyond his daily practical work, will require very little urging to use the possible best care in making the few entries of raw materials, etc., into the form provided for that purpose. The work is by no means so complicated as it may appear. It has been the writer's experience that fully ninety-nine per cent of beater engineers, once made acquainted with the work, faithfully perform that specific part of their duties and take pride in submitting accurate beater furnish sheets.

It has been pointed out in a previous installment that practically all weights and measures of raw materials and process supplies are standardized. The respective net weight of the contents of a car of rag half stuff, a bale or lap of sulphite, etc., has been determined as well as the dry contents of a pail or gallon of liquid process supplies. The cost accountant has these standard weights for the various units at his disposal, and therefore the beater engineer enters only the number of the respective material units into the beater furnish sheet. Color is practically the sole exception; the nature of this material and its application require weighing of the needed quantity for each individual beater.

After the completion of a run on a production order, the Beater Report (Fig. 7) is submitted to the superintendent, who, enabled by his knowledge of the furnish, is in a position to easily detect obvious inaccuracies that may have crept in. He will make the necessary investigations and resultant rectifications before forwarding the sheet to the cost department. In the latter the various items in the beater report will be added up and the obtained totals transcribed into the Cost of Furnish sheet (Fig. 8). Here these totals are converted into pounds or other standardized cost units, their respective cost determined and entered into the column provided for that purpose. An addition of the various sub-totals will then represent the total cost of the gross furnish.

At the end of a cost period the accumulated cost of furnish sheets (Fig. 8) are compiled in a Summary of Production Orders—Cost of Furnish (Fig. 9).

DATE..... No. of Eng.....

PRODUCTION ORDER No.....

COST OF FURNISH

Grade:..... Color:.....

Units	MATERIALS	Weights		Price	Cost	
		Per Unit	Total	per Unit	Sub-Total	Grand Total
	Rag Half Stuff					
....cars	Drainer No.....					
....cars	Drainer No.....					
....cars	Drainer No.....					
	Paper Raw Stock					
....cars	Lot No.....					
....cars	Lot No.....					
....cars	Lot No.....					
	Sulphite					
....bales	Lot No.....					
....bales	Lot No.....					
....bales	Lot No.....					
	Soda Pulp					
....rolls	Lot No.....					
....rolls	Lot No.....					
....rolls	Lot No.....					
....rolls	Lot No.....					
	Process Supplies					
....pails	Alum, Dry Wt.....					
....pails	Beater Size, Dry Wt.....					
....pails	Glue, Dry Wt.....					
....bags	Filler.....					
....oz. or lbs.	Color.....					
"						
"						
"						
"						
	TOTALS:					

Figure 8

This summary simplifies the entry of cost components into the controlling accounts and inventory records. Thus endless entries of small items from Fig. 8 are eliminated and a better and more convenient check against physical inventories and stock records may be exercised.

It is therefore quite evident that the usefulness and accuracy of controlling accounts and stock records depend upon the correctness of the data assembled in beater reports and summaries.

The accuracy of the figures exhibited in the beater reports may be quickly verified by checking them against the machine report of rough paper, covered by the very same production order. Furthermore, entries at the end of a cost period from the summaries into controlling accounts and inventory records and comparison of book totals with physical counts will promptly disclose any existing discrepancies.

The former method of checking is the quickest, as it can be carried out immediately upon completion of a run. Taking into consideration the loss of stock incurred by invisible waste in beaters and paper machines, as well as the machine broke that has not been used in the same run but is to be credited to it, the weight of the gross furnish must tally closely with the total weight of rough paper made on that specific production order.

In mills with a stores system[1] and a perpetual inventory, raw materials, etc., recorded in the Cost of Furnish sheet (Fig. 8) may be entered therefrom into the individual records. To issue requisitions on stores to cover the issuance of these materials would entail much clerical work and in reality mean an unnecessary duplication of the transaction.

The Beater Report (Fig. 7) shows a few columns for the entry of beating time. (The start is the time at which the furnish of the beater is begun, and the stop is the time when the beater roll is lifted and the actual process of beating terminated.)

These entries of beating time are of comparatively little importance to the cost work, since there is no Beater Room Departmental Rate. Beater room labor expenses are incorporated in the Paper Machine Hour Rate. As illustrated by the interspersed Figures 7, 8 and 9, only the cost of the ingredients used in the furnish is recorded and calculated; the actual labor expenses are recorded in the departmentalized payroll.[2]

Nevertheless, a record of beating time is required for the maintenance of efficient beater room operations. Uniform beating time means uniform stuff and a uniform product. Beating time will, of course, vary according to the grade of paper and the condition of equipment. At any rate, the beater room must produce sufficient stuff to permit continuous running of the paper machines. At the same time, the stuff must be properly prepared in order to yield a high class product. Hence, uniform beating and strict adherence to the established standard beating times, uniform high quality of raw materials and supplies, furnished to the beaters in proper proportion and logical sequence, give a product that is highly

SUMMARY OF PRODUCTION ORDERS—COST OF FURNISH

Month of.....19.....

Date	P. O. No.	Rag Half Stuff		Paper Raw Stuff		Sulphite		Soda Pulp		Process Supplies		Colors		Total Cost of Gross Furnish
		Weight	Cost	Weight	Cost	Weight	Cost	Weight	Cost	Weight	Cost	Weight	Cost	
	TOTALS:													

Figure 9

1 "The Stores Department," The PAPER INDUSTRY, August, 1922.

2 "Wages, Timekeeping and Payroll, The PAPER INDUSTRY, August, 1923.

satisfactory and up to the established standards in every aspect.

Today, more than ever heretofore, the reputation and success of an enterprise depend to a large extent on the uniformity of its products. No manufacturer can afford to depreciate the quality of his goods; his products must invariably meet the requirements of the established standards in order to retain the confidence of the trade.

Résumé

The forms used in connection with beater room activities for the recording of cost details must furnish the following information:

1—How many pounds of raw materials and process supplies were used to produce a certain quantity of paper covered by a specific production order?

2—What is the total cost of the gross furnish?

3—What is the actual ratio between gross furnish and the total of rough paper?

4—What is the invisible waste and its relation to the actual weight of the components, especially filler per beater and the retention?

5—How many pounds of alum, size, starch, etc., were used? How do their liquid measures conform to the dry weights? How do the quantities compare with the furnish instructions and former furnished for a similar grade of paper?

6—Does the quality of the furnish, method of furnishing and beating, as well as beating time, conform to the prevailing standards and secure a uniform product?

7—What can be done to eliminate doubtful or unsatisfactory features?

8—How does the cost of the gross furnish compare with that of a previous run? What is the cost of furnish per 100 lbs. of rough paper? Is it over or under the cost of similar previous runs, and why?

A thorough study of these features and prompt application of corrective measures whenever found necessary will no doubt bring gratifying results and increase the value of cost records and their bearing on the control of manufacturing processes.

New Mill of Frank Smith Paper Company

TO MEET the increasing demand for the products of the Paul A. Sorg and W. B. Oglesby paper mills in Middletown, Ohio, a subsidiary company was organized with the same executive force, consisting of J. A. Aull, president; A. Frank Smith, vice-president; L. C. Anderson, vice-president; M. T. Hartley, secretary; H. C. Johnson, treasurer; and C. F. Aull, assistant secretary and treasurer, and called the Frank Smith Paper Company.

The new mill, embodying many features developed from Mr. Smith's very successful experience as general superintendent of the Sorg-Oglesby mills, has aroused considerable interest among paper makers. It is now completed and ready for operation.

The oldest unit of the Sorg-Oglesby group is the W. B. Oglesby mill, which was built in 1852. The Sorg mill was built later in 1899 and acquired by Paul A. Sorg Company in 1905. Mr. Sorg was the founder of the P. J. Sorg Tobacco Company, making the well known Polar Bear brand of smoking and chewing tobacco, which was later absorbed by the American Tobacco Company.

A. F. Smith came to Middletown in 1907 to be assistant superintendent of the Sorg mill. Two years later, upon the death of Mr. Colvert, he became superintendent, and at this time planned the reconstruction of the machine room. A Horne Fourdrinier was installed and the Horne four-cylinder machine rebuilt. These improvements added to the production and earnings of the company, proving highly efficient and successful. In 1915 the Paul A. Sorg Company acquired by purchase the W. B. Oglesby Paper Company adjoining and Mr. Smith was made vice-president of both companies. At the time of purchase, the production of the Oglesby mill was from 600 to 700 tons of paper per month. Through Mr. Smith's ability and persistent effort, this has been gradually increased to 1,200 tons per month.

Among the wide variety of products of the company are paper and board for playing cards, magazine covers, tags, gasket fittings, ceramic tile paper, carpet twisting paper, panels and door packings used in Ford cars and Globe-Wernicke files.

The new Smith mill is located west of the Oglesby mill and adjacent to it on ground that has been reclaimed within the last seven years. The whole area was formerly in the high water zone of the Miami river. Further protection is now assured by a levee surrounding the area. The buildings are

The Frank Smith Paper Co. mill—bleach house in the right background

constructed of re-enforced cencrete and red brick with wood roofs insulated with Cel-O-Tex. Steel window sash are used throughout with double sash in the machine room walls. To provide the utmost solidity and rigidity for the beaters, exceptionally massive foundations extend down to hard pan, twelve feet below the basement floor.

Bleaching Room

Pulp and other materials are received at the east end of the mill. The pulp bales are carried to the second floor and, being usually in the form of dry sheets, are fed into a Mitts & Merrill shredder driven by a 100 H. P. motor. The shredded pulp is delivered to three concrete Moore & White bleachers, consisting of concrete tile lined tanks equipped with a screw carried in a vertical shaft. These are each designed to hold 8,000 lbs. dry weight and circulate the stock at a density of 15 per cent or higher. The stock is kept in circulation by the large screw contained in a cylinder open at both ends located vertically in the center of the tank. The screw forces the stock down through the cylinder, up on the outside, repeating the operation.

When the bleaching is completed the pulp is dropped into horizontal wood tanks, each equipped with a horizontal agitator. In these tanks the stock will be diluted to about 4 per cent consistency, then pumped through a Shartle 10x20 duplex pump to stuff regulating boxes, mixing box and Oliver vacuum filter for washing. The capacity of the Oliver is rated at 4,000 lbs. per hour. Experiments conducted before the selection of this apparatus indicate as complete washing, using 1½ gallons of shower water per pound of pulp as by washing in the beaters, using from 13 to 15 gallons.

The washed pulp will be delivered from the filter at about 15 per cent density into a 12x24 foot chest, where it will be diluted with fresh water to a consistency suitable for pumping to the beaters.

Beater Room

Eight 1,600 pound Horne Patent beaters are installed in the beater room. The rolls are 60 inches in diameter with a 72-inch face. The beating capacity is much larger than needed for the anticipated business, but is provided to equip the mill for a still wider range. The massive foundations under the bed plates extend down to hard pan, about twelve feet below the basement floor, to give almost literally a solid rock foundation, this being considered of especial importance toward securing maximum beating action and uniformity of beating.

The stock in the beaters will be thickened to a beating density of about 7 per cent, the water being extracted with the usual octagonal washer. This is collected in tanks and returned to the bleachers for filling and diluting the stock after bleaching. Indicating watt-meters calibrated to show

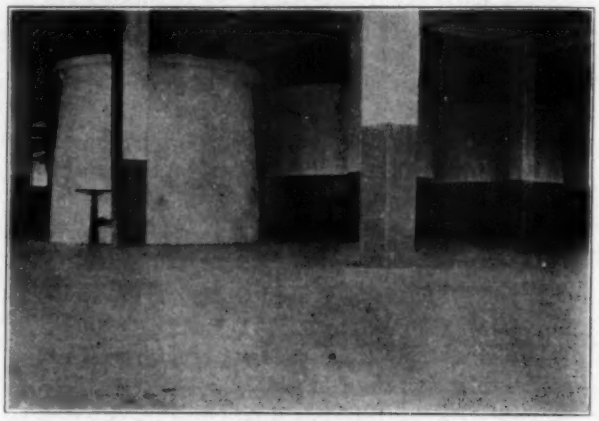
View of beater room, showing four of eight Horne Patent Beaters

horse power are placed on the wall to aid the operators in handling the beater rolls.

Size will be delivered from tank cars to a storage tank in the basement of the bleaching room, from thence forced by compressed air to a size emulsifying plant on the floor above the beater room, the Western Paper Makers Chemical Company system being used. Alum will be dissolved in tanks on the same floor and piped to the beaters.

The beaters are dumped into a large receiving tank located centrally underneath, which receives stock from all of the beaters. This affords an opportunity for dilution to uniform consistency. The side of the tank is of wood set on a concrete conical foundation, sealed with asphalt. The stock is pumped from the center of the bottom by a centrifugal pump set underneath which has a switch designed to throw out when the load is released, so that the pump stops automatically when the tank is empty.

The stock is pumped from this tank into one of two, 16-foot



Moore & White Bleaching System

diameter, vertical, stuff chests in the machine room and from this chest pumped to the second chest of the same size, through a 10x15 triplex Moore & White stuff pump. A Trimbey consistency regulator is installed between the chests for further assurance of uniform density. Agitators in these chests are the Hill clutch propellor type for thorough mixing. A second Moore & White 10x15 pump delivers to two Noble & Wood Mammoth Jr. Jordans of special design. The Jordans deliver into the back water box and then to three Moore & White rotary screens.

Machine Room

The machine, built by J. H. Horne & Sons of Lawrence, Mass., will trim 108-110 inches and will produce 3,000 to 4,000 pounds per hour. The wire is 80 feet long. The table rolls are carried on roller bearings with stainless steel rollers. The bearings are adjustable on the shake rail for any desired number and spacing of rolls. The shake head is of special design with amplitude of shake adjustable without stopping the shake and driven by an individual variable speed motor having a speed range of 3 to 1. The fourdrinier is the Smith-Davis patent with overhead suspension. Rubber covering is provided for the suction boxes and wire guide roll. The wire return rolls are all mounted on ball bearings. By means of the machine water header clamped to the bottom frame of the Fourdrinier, the showers are raised and lowered with the wire. The floor at the wet end of the machine is covered with cast iron plates, with open checkerwork, making it impossible for any water to accumulate on the floor at any time.

The machine is equipped with Millspaugh suction couch and press rolls followed by a second press of the usual type. Smoothing rolls are mounted on the dryer frames to receive the paper coming from the second press. The dryers, 48 inches in diameter, are 30 in number and equipped with a Sheehan rope carrier for taking over the paper. The dryers are mounted on Millspaugh "Grindstone" roller bearings. Two-thirds of the distance toward the dry end, sand rolls of chilled iron calender the sheet while still wet. At the end of the dryers are two cooling drums.

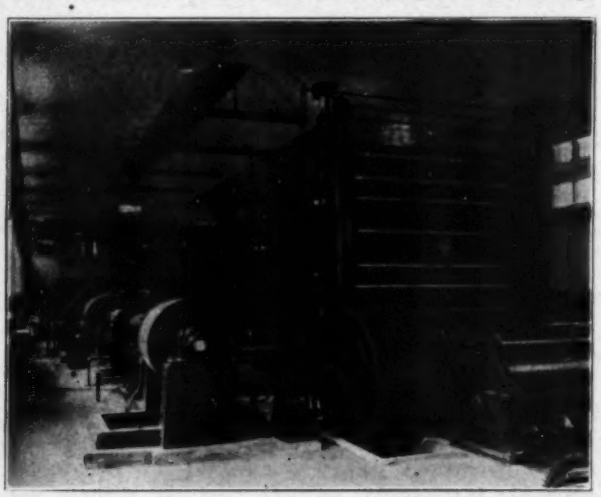
The paper from the dryers passes through two calender stacks, equipped with the Bowser lubricating system, and from there to a Bagley and Sewall uniform speed reel and Moore and White four-drum winders. The entire machine is set very low. The bearings of the bottom dryers are just above the sill plates. The wire is 39 inches above the sills.

An electric hoist takes the paper rolls from the machine directly to the Fairbanks scales where they are weighed. From here they are taken to the opposite end of the mill for storing or shipping. A Reading 8-ton crane travels the entire length of the machine room for handling machine parts.

All sections of the machine are driven by Cleveland worm gear units, each equipped with a Cutler-Hammer magnetic

clutch; all of the back stands are equipped with SKF ball bearings. The worm gears are provided with continuous flood lubrication by oil pumps with reservoirs. Power is transmitted to the machine through a line shaft mounted on SKF bearings, all ball bearings except the main drive, which are taper roller type. The winder is arranged for driving either by a Crocker-Wheeler variable speed motor or from the variable line shaft in the usual manner.

The machine room roof is carried on flat trusses of which the lower chords carry a suspended ceiling made of cinder concrete tile and Keene cement. Into the space between the roof and ceiling, hot air is discharged from a Clarage Fan Co. unit of 40,000 cu. ft. per minute capacity. Openings in the four corners of the machine room permit this air to pass downward into the machine room, flowing along the under side of the ceiling to the two ventilators, one central over the dryers of the machine, and one over the future second machine. The ventilators are the special design of B. M. Baxter. The dryer pit is entirely open, the bottom dryer felts being within reaching distance of the basement floor. In the basement are installed four Clarage unit heaters, drawing air from outside, supplying a liberal amount of dry air into the basement. This air passes freely up around the dryers to the ventilators, supplying sufficient air to carry off, with the roof ventilation, the vapor from the drying sheet. The warm ceiling prevents all possibility of drip and the flow of warm air from the corners of the room to the ventilators prevents any accumulation of dead, moist air at the wet or dry end. Four American Blower unit heaters are installed in the machine room for use in extreme weather. The beater room is heated with one Clarage



Horne Fourdrinier machine, showing drive side

unit heater drawing fresh air and one American Blower heater for recirculation. The bleaching room is heated by a similar Clarage unit.

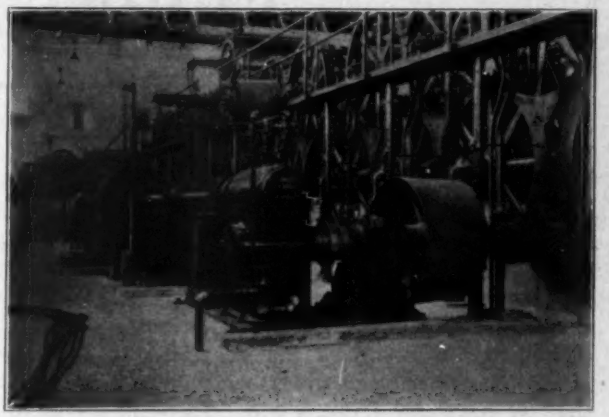
Power

A unique feature lies in the fact that the mill is electrically driven throughout. Steam for drying and heating is supplied from the Oglesby mill.

Four of the beaters are driven by individual Crocker-Wheeler slip ring motors and four from a line shaft by Leunix vertical drives with Cork insert pulleys, this line shaft being driven by a 375 H. P.—0.8 power factor, Electric Machinery Manufacturing Co., synchronous motor. The Jordans are coupled direct to 200 H.P.—1.00 power factor, Electric Machinery Manufacturing Co., synchronous motors. It is anticipated that some special papers to be manufactured will require long treatment in the beaters with little action in the Jordans, while others will have comparatively little beating, but will require hard setting of the Jordans. Synchronous motor capacity is provided to maintain high power factor under either condition.

The machine is driven by a 200 H.P., direct current, Crocker-Wheeler, variable speed motor supplied by a Crocker-Wheeler motor generator set. The variable speed motor is of the three bearing type, carrying two pulleys on the shaft. Two receiving pulleys are mounted on the variable line shaft, motor pulleys and line shaft pulleys being calculated for the same belt length on either set of pulleys. The machine drive is designed for a speed range of from 80 to 320 feet per minute on the low-speed pair, and from 200 to 800 feet per minute on the high-speed pair, a wide overlap provided to minimize the shifting of the drive belt.

A constant speed shaft driven by a 125 H.P., Crocker-



Cleveland worm gears applied to dryers

Wheeler, slip ring motor drives a 16x24 Connersville vacuum pump serving the couch roll, a 14x20 Connersville pump for the suction press, two small Connersville pumps for the wire boxes and a Connersville combination set for dryer condensation as well as the fan pump. The stuff pumps and agitators are driven by individual motors.

Nearly all motors are operated by automatic push button controls. Beater motors are operated by push button stations on the beater room floor. Jordan motors are also operated by push button control with automatic frequency relays for cutting in the fields when starting, avoiding any chance of mishandling. Motor controls of induction motors are mainly Allen-Bradley. Synchronous motor controls are a combination of Electric Controller & Mfg. Co. with Electric Machinery Mfg. Co. frequency relays. Controls were selected of time limit type or current limit, according to the starting characteristics of the machinery driven.

The main power board was supplied by the Post-Glover Electric Co. Power for operation is provided partly by a 500 K.W. extraction type Moore steam turbine installed in the Oglesby mill adjoining and partly by purchased power. The turbine unit will be operated in parallel with the central station with provision for synchronizing and cutting in the unit from the Smith mill control board and with automatic relays for clearing the board of all power except machine drives in case of sudden failure of the control station power.

Steam will be supplied for drying and heating through a 12-inch main from this 500 K.W. unit, the latter being designed

Tank for receiving stock from beaters

of sufficient bleeding capacity to supply two paper machines.

Water is secured from two Kelly concrete wells in which are installed two, 20-inch, American well works, vertical shaft,

(*Continued on Page* 1293)

Editorial Comment

By WILLIAM SIBLEY

Are You a Slacker?

IN TIME of war it is the duty of every citizen, regardless of sex or creed, to do everything in his power to help the nation. In rendering such national service, the citizen is adding weight to the side making for the betterment and the permanence of the country he calls his own. That the citizens of the United States have never failed, in time of need, to give the required service is evidenced by the fact that we have never lost a war. Had the people of the United States, or even half of them, failed to do their duty in times past, we venture the assertion that the United States would have been defeated in past wars and that this would be a nation far different than it is today—a nation not so wealthy in material assets nor so rich in liberty and freedom.

Every four years the citizens of this country are faced with an emergency. Not a war emergency, but one that is almost as important; that can be quite as far-reaching. And it is the duty of every citizen of the United States to render his national service at those four-year intervals—just as clearly so as it is his duty to lend his help in time of conflict.

One of those stated intervals is not far off. The day is November 4th. That day we elect a President of the United States. On that day we select the man we wish as our Chief Executive. Every citizen of the United States, regardless of sex, is entitled to vote. To vote is to render a national service. To vote is the duty of every citizen.

We are told by statisticians that in 1896 over 80 per cent of the voters cast their ballots. In 1900, 72 per cent of the citizens voted. In 1908, that percentage decreased to 66. In 1912, 62 per cent, and in our last election (1920), less than 50 per cent.

Less than half the people of this country are casting ballots. Less than half the citizens of the United States are voting. That condition is a national menace. It is effecting the welfare of our country. Since the growth of public indifference to election days—since 1896—there has crept into our legislatures distinctly detrimental influences. Because of public apathy toward the exercise of our national birthright, the vote, our government has been split into "blocs," factions and groups. The control of our government has fallen into the hands of those holding "the balance of power." That is a condition never intended by our forefathers. Regardless of who holds the "balance" of power, the system is un-American. The word "bloc" doesn't even appear in American dictionaries. "Bloc" systems menace the welfare of our government. And it is all because half the people of the United States do not vote.

We are not attempting to tell the reader how to vote. Vote for whom you please. We rave no quarrel with personal convictions. The idea is—VOTE.

In time of war we call those who do not do their duty—slackers. At election time those who do not do their duty are none the less.

We Leave You to Find the Moral

NOT long ago we had the pleasure of reading a letter received by a trade journal editor. It was from one of his field men and told an interesting story. The editor very kindly consented to let us reproduce it below, names omitted, of course.

"* * * Had a great time with Mr. ——— of the ——— Company today. I waited all morning for him to show up, and when he finally did come in, he was all fussed because some of his equipment was down for repairs.

"Finally he got around to talk to me, and said he wasn't interested in our periodical and has ordered the subscription stopped. He said it was a d---d shame the way the mails were cluttered up with stuff that nobody ever read.

"I told him that no one was forcing the journal on him; that if he wanted it he would have to pay for it like everybody else who gets it; that we would probably manage to continue business without his subscription. I started to leave, but he calmed down and became apologetic, finally saying the real reason he didn't continue his subscription was that business was bad and they were cutting down expenses, including advertising and subscriptions to all trade papers.

"I said he was the first producer in his district who had told me business was bad. He replied that any producer who said otherwise was a liar. I told him that I knew neither "Smith" nor "Jones" would lie to me about business conditions; and then he admitted that "Smith" and "Jones" might both be doing good business because they had some big contracts to fill.

"I subsequently got a line on this firm. Their equipment is all worn out, much of it being obsolete. They inherited the business from their father, and I take it, have gone on—putting nothing in and taking everything out—until they have left a pile of machinery fit only for the junk pile. And since they are the kind of people who cannot find time to read

—— on Timely Subjects

trade papers and who can't afford to advertise I do not wonder at their doing this. I believe the sheriff's door is not far from their office."

Government Ownership or Private Enterprise?

MR. BYRAM, president of the C., M. & St. P. Railway, recently cited some facts and figures that are of interest to every one. We cannot quote him verbatim, but the facts he brought out are:

Canada has invested in national railways a sum exceeding $1,250,000,000. The net operating income in 1923 was $13,000,000 or slightly in excess of one per cent on the investment.

Italy owns 10,000 miles of railways on which there was a deficit of 1,200,000,000 lire in 1922. The Italian government is now trying to lease the lines to private companies. In ten years the number of service employees on Italian railways has increased from about 150,000 to 228,000.

In France every one of the six privately-owned railways showed a very slight profit during 1923. The lines owned by the French government showed a deficit of 145 millions of francs for the same year.

Sweden has constantly been compelled to bear a deficit in railway operating expenses. Recently a petition was circulated, asking the Swedish government to denationalize the railways.

The sale of the Central Brazil Railway to private interests has been recommended by the British financial mission in Brazil. This is because operating expenses have been 15 per cent more than revenues.

Mexican National Railways earned, during 1923, less than 50 per cent of the fixed charges.

New South Wales, because of the deficits incurred through government control or ownership of public utilities has a per capita tax burden twenty times that carried by the residents of Michigan.

The Transportation Act of our own country provides that if the railroads earn 5¾ per cent on the fair valuation of their property they may retain that amount as a return on their investment, but there is no guarantee of such a return if they fail to earn it. In 1921 (the first year under the law) the railroads of the United States earned a return of 3⅓ per cent. In 1922 the return was 4 per cent. In 1923, 5 per cent.

We do not believe a 5 per cent return on any investment is confiscatory. We do believe our railroads should be left in the hands of private enterprise.

Is It Worth a Dollar?

JUST suppose you were a soldier in France and that you had endured the screech of the shells, the patter of the machine guns and the hum of the aircraft until your every nerve was taut—until you jumped a foot at every little squeak—until you weren't worth a nickel either to yourself or to your company. Supposing that—would it be worth a dollar to be put in a quiet ward in some hospital or in a remote chateau where you could just rest and forget?

Just suppose you were in a terrible flood and that your home has been ruined, leaving you destitute, without a place to lay your head. Suppose your wife and kiddies were with you and in your destitute condition you could not provide even shelter for them from the incessant rain. Supposing that—would it be worth a dollar to have some man give you, without cost, a little tent, some hot coffee and a loaf of bread?

Would it be worth a dollar to belong to an organization that does that sort of thing constantly?

Well—from November 11th to November 27th you are going to be asked to contribute a dollar to the Red Cross.

Making Use of Slow Business

ALTHOUGH business is generally on the upward climb and the depressing "slack" is, for the most part, only history, there are still some plants that are operating considerably below capacity.

Such a situation offers an excellent opportunity to improve plant conditions—to rearrange machinery, replace that which is obsolete, install better material handling equipment, effect a general cleaning and institute a thorough overhauling and repair. Certainly this kind of activity is far better than shutting down or sitting still and bemoaning "poor" business.

Every superintendent or manager must, of necessity, be something of a speculator. He must judge, at least to some extent, future needs. In time of small need he must know whether it is wise to disrupt his organization through a shut-down or keep his key men on either part time work or shop repair. Allowing for exceptions, the broader course is the road to follow. It requires real courage to send money when the order book is only half full, but business is coming back rapidly and will be in full swing this winter. It will go to those who are prepared to take care of it.

Practical Helps for the Mill Man

Steam Economy at Port Edwards

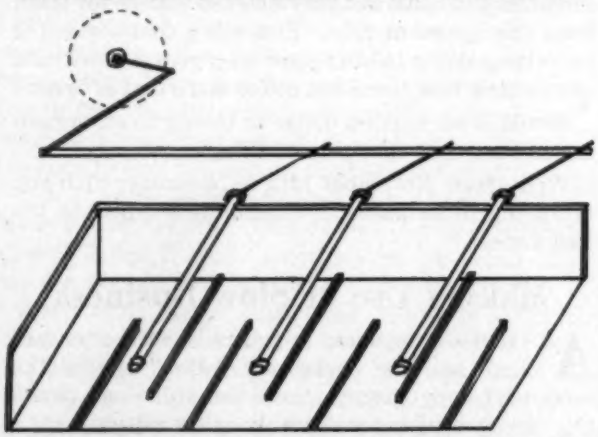
THE Port Edwards mills of the Nekoosa Edwards Paper Company are now operating on a complete exhaust steam system where low pressure steam from a 1,500 K.W. Westinghouse extraction turbine is used. During the winter of 1923-24, the mill was heated entirely by bleeder steam, making a very noticeable reduction in the heating cost for the season.

The bleeder main extends the entire length of the mill, and all low pressure process as well as heating steam is taken from this main. The engines driving the individual paper machines are connected to the main with three-way valves so that during washup periods this steam is turned into the bleeder main where it formerly went out doors. It is estimated that this alone makes a saving of $1,500 per year per machine. The relief valve from the bleeder main is connected to the feed water heater, so any surplus is taken care of in the boiler plant.

Three Briner economizers are in service, one on each of two Yankee machines and one on No. 5 machine making wrappings. Recent figures show a 75 per cent return on the investment on the Yankee machine and 50 per cent on the wrapping machine after deducting operating and overhead expenses. All three economizer installations are used in connection with cross ventilation.

Showers for Flat Screen

AN ARRANGEMENT giving very efficient screening on boxboard stock is shown in the sketch. It consists of oscillating showers and baffles. The baffles are arranged so that the stock passes back and forth across the screen while



the showers are turned toward and back, keeping the stock in motion and aiding in screening. The three showers are operated by levers attached to a single arm, operated from a drive shaft above.

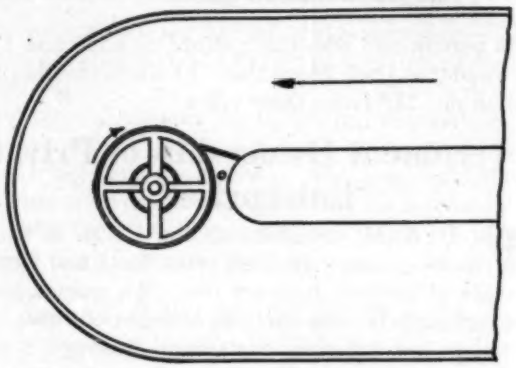
Use of Warm Water in Cylinder Showers

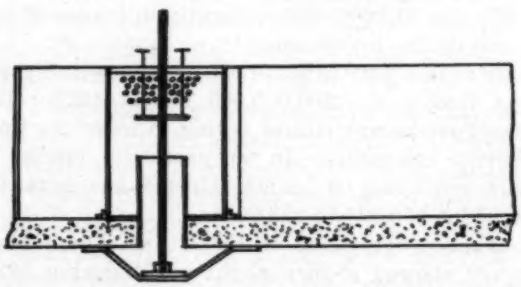
THE use of warm water in the cylinder showers is said to have increased the production of one machine 25 per cent. The effect of the warm water is to make a freer stock so that the machine can be run faster without crushing. Exhaust steam is used for heating the water to a temperature of 105 degrees F., which is kept the same the year around. No harm is done to the felts, which was feared at first, but instead they last longer since they are more easily cleaned. Cold water is used on the felt showers. The use of the warm water is said to permit the use of a cheaper stock as it makes it freer.

New Attachment for Continuous Heating

A NEW continuous beating attachment for working up old paper, preparing it for making boxboard, has been designed. The apparatus consists of a 36x48-inch perforated steel cylinder with 1-inch holes set into the beater vertically at the end of the midfeather. This is carried on a vertical shaft turned at the rate of 8 R.P.M. by an overhead drive from the beater shaft.

The stock is circulated in the beater with the roll raised about 6 inches from the bottom. As soon as it becomes broken up enough, it passes through the perforated cylinder, then through an adjustable gate into the chest below. As soon as the chest is full, the inside of the cylinder fills up, preventing more stock entering. A doctor board and shower are provided to keep the holes in the cylinder from plugging with stock.



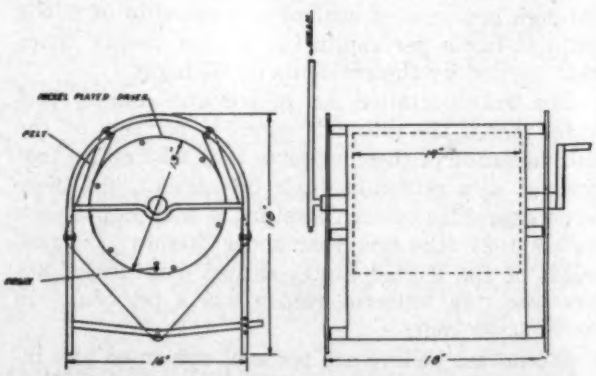


The attachment is now in use on a large beater with a 40-foot tub handling seventy-five tons in twenty-four hours. This is placed near the point where the bales of paper are received in the mill and the prepared stock pumped to the beaters, thus doing away with much trucking and handling of the bales.

This beater has replaced four 1,800-pound beaters and seven men in the beater room. It is estimated that it will save $25,000 per year in the maintenance of the beaters and Jordans.

Dryer for Small Samples

IN THE drawing is shown a convenient dryer for small hand samples. The cylinder is nickel plated to prevent the sheets sticking and gives a surface that will remain smooth without rusting. The apparatus consists of a 13x14-inch steam cylinder and felt to hold the sheets against the dryer.



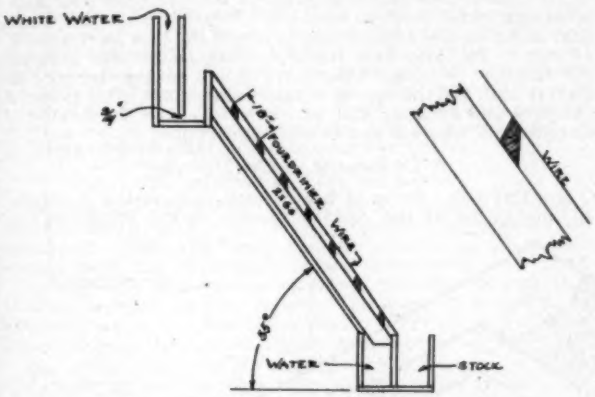
The samples are placed against the cylinder, which is turned by the crank until they are dried. This closely duplicates the conditions on the machine and will not burn the samples.

Inclined Screen Saveall

ONE of our friends after receiving a number of inquiries as to the way he builds his inclined screen savealls gives us this description:

As the water runs through the wire, it has a tendency to cling to the bottom and run down along the under side, filling up the wire and decreasing the capacity. In order to prevent this, cross pieces placed at intervals of 18 inches support the wire and take away the water. This helps to prevent the wire from filling up and increases the capacity materially.

A saveall 10 feet wide by 18 feet long handles the excess

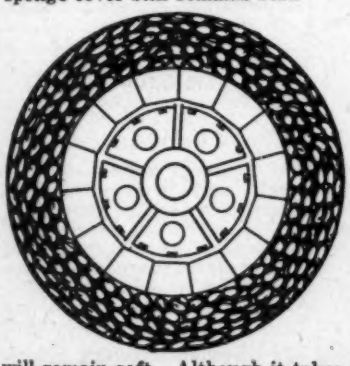


white water from a 40-ton news machine with an efficiency of about 50 per cent. Old machine wire is used for covering.

In one instance, a similar affair was used in a sulphite mill for washing stock from the blowpits before screening. It was found that a half hour could be saved in the washing time of the stock in the pits and that the bleach consumption was cut down 2 per cent. The washer, 12 feet by 42 feet, handles 125 tons of sulphite per day.

Sponge Couch Roll for Boxboard

SPONGE couch rolls have been replaced in most board mills by felt or rubber. However, in one instance we are informed that they are using them with excellent results, the rolls lasting five or six years, or until the wood rots out. The sponge cover still remains soft.



The roll is made up of slices of ordinary grass sponge ¾ of an inch thick. The sponges are prepared by soaking them in water. They are sliced half through so that they may be more easily twisted into hard rolls and nailed in place with large headed nails. First, a ring is nailed around the center; then the covering built out from each side, nailing the sponges tight together. This gives a covering four inches thick that will remain soft. Although it takes three weeks to cover one roll it will last five or six years without attention.

A similar covering has also been used with good results on the top rolls of the first few baby presses.

Wide Spaced Trash Racks Used

AFTER trying out one set of wider spaced trash racks for two years without experiencing any difficulty, The Nekoosa Edwards Paper Co., of Port Edwards, Wis., are now using racks with a four-inch clear space on all of their single runner vertical hydraulic units.

Mixer for Calender Colors

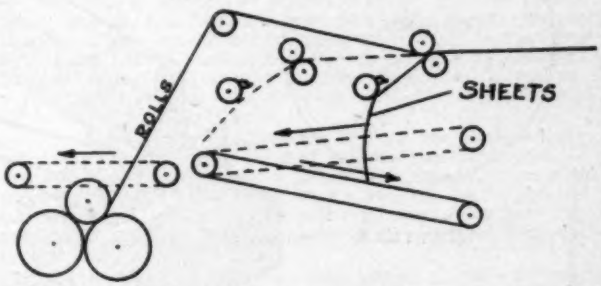
INSTEAD of mixing calender colors for boxboard in a barrel with a paddle, in one mill they have substituted a 36x 48-inch galvanized iron tank with a vertical agitator driven from the machine line shaft. The tank is piped directly to the color box. This has saved much time and trouble in mixing colors and keeps a uniform mixture.

Alarm for Breaks

AN ELECTRIC alarm giving the signal when breaks occur has been a great help in one instance on a boxboard machine. By improving the screening equipment, it was possible to do away with one man, but it was also necessary for the machine tender to watch the wet end and stock more closely. For this reason it was seldom that anyone was watching the sheet passing over the dryers, so if a break did occur it would not be discovered very readily. By tying a string across the machine with one end fastened to an ordinary burglar alarm switch to give the signal when a break occurred, it was unnecessary to be as much on the lookout. When the weight of the sheet falls on the string it closes the switch, giving the signal. Seven of these are placed at intervals between the two bottom dryer cylinders and one at the third press, so that if the sheet breaks there the press may be stopped before the felt is torn.

Cutter Made to Run Sheets and Rolls at Same Time

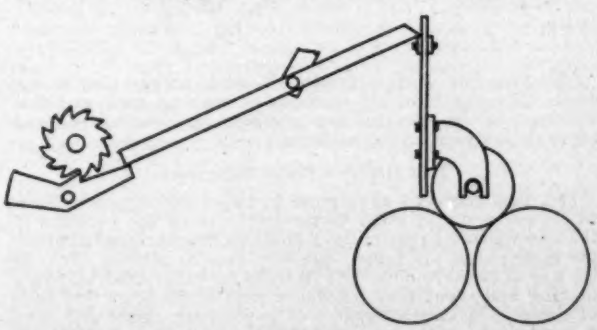
ON SEVERAL occasions one boxboard mill received orders for both sheets and rolls of the same stock in sizes that made it difficult to utilize the full production of the machine. It was decided that if sheets and rolls could be run at the same time it would be much more satisfactory. Accordingly the



cutter was changed as shown in the diagram. When running sheets entirely, the second cutter is used and a second carrier takes the sheets to the boxes. When both sheets and rolls are to be run at the same time, the rolls are wound directly from the machine on a drum winder driven by a variable speed motor. The sheets are passed through the first cutter onto the first section of the carrier, which has been reversed by twisting the belt, and the first roll lowered to take the sheets to the boxes, which have been placed between the end of the dryers and cutter.

Automatic Regulator for Size of Rolls

IN PLACE of its being necessary for a man to gauge each roll on the rewinder and stopping the machine when it grew to the required size, one mill has substituted the automatic device shown in the illustration, with very good results. As soon as the roll is the right size, the belt tightener is released and the machine stopped automatically. As the roll grows larger, it lifts the rider until it hits the lever, forcing it up and tripping the dog. This releases the tension on the belt driving the rewinder and stops it. By adjusting the nut, tripping the lever, it may be set to stop the machine when the roll gets to be any desired size.



Board Making Process at Gardner & Harvey Plant

WHEN the box board division of the American Pulp and Paper Mill Superintendents' Association met last May at the plant of the Gardner & Harvey Paper Co., Middletown, Ohio, their interest was aroused in the very unusual method of stock preparation carried on by that company. Considerable discussion was indulged in at that time as to the merits or demerits of the principle involved, and all questions were satisfactorily answered by the father of the idea, Mr. Tom Harvey, general manager of the company.

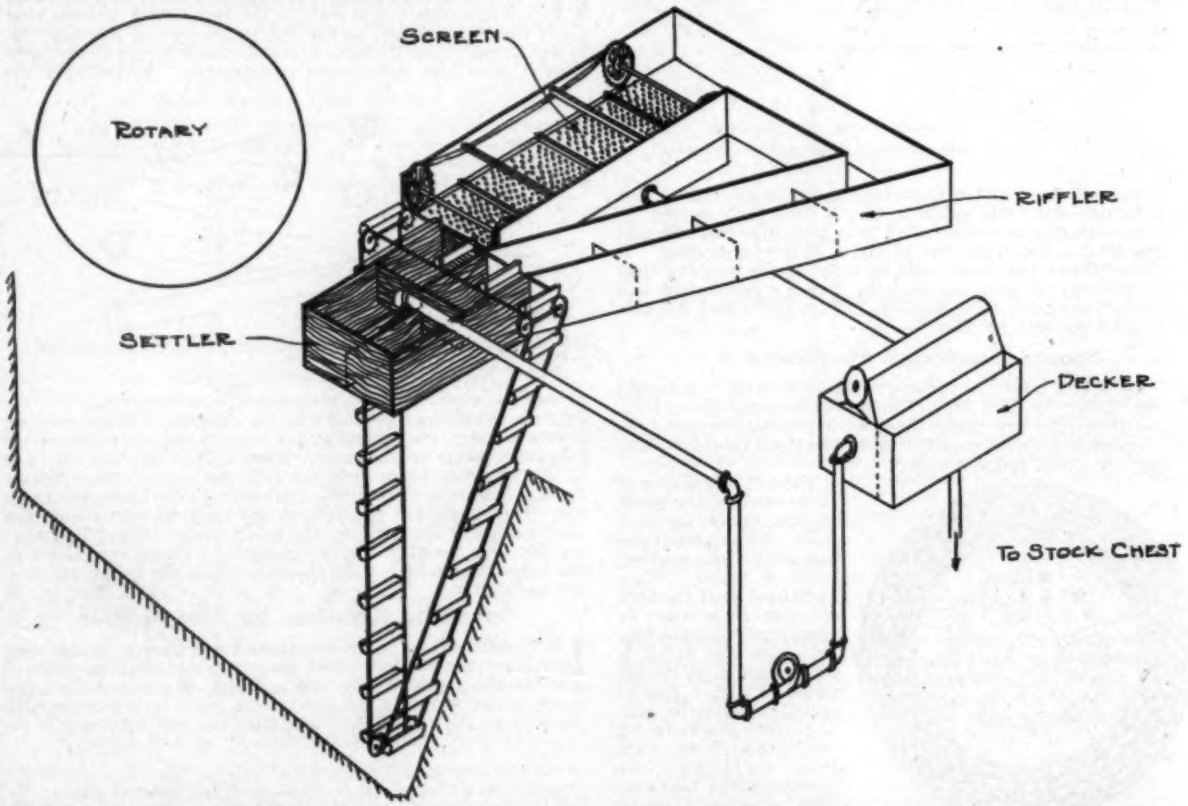
The preparation of stock for making of box board is a subject in which board makers are now beginning to show a great amount of interest, and in the opinion of many, this part of the manufacturing has until recently been the most neglected.

The success which the Gardner & Harvey plant has obtained through the operation of its particular method is such that a description of it should be of exceeding interest.

manage the Gardner & Harvey mill. This was the first opportunity that Mr. Harvey had yet received to build a paper mill after his own individual ideas. His stock preparation system was not installed at that time, however. He proposed to his father, then superintendent of the Colin Gardner mill to let him install it there first, but his father was very skeptical about it, and advised him to forget the idea as it was of no value. In 1912, Tom Harvey's faith in the idea induced the directors to allow him to try it out in the Gardner & Harvey mill, and the success it achieved resulted in his father's complete endorsement and an order to put it in the Colin Gardner mill where it now is also in operation.

A Combination of Old Methods

Mr. Harvey's system of board stock preparation is simply an application of the cooking process to the rough, mixed



The principle of this system of stock preparation is not much different from old methods of making book and fine writings, in the manufacture of which Mr. Harvey received his early training and experience.

Tom Harvey's Broad Experience

Mr. Tom Harvey's experience in paper making dates back to his early youth, when he started to learn the vocation in the fine writing paper mills of Holyoke, Massachusetts, under the direction of his father, the late Thomas Harvey, Sr. At the age of twenty-one he left Holyoke for other fields of paper making and spent fourteen years with E. B. Eddy Co., Ltd., of Canada, making all grades of paper from tissue and news to box board. Later years called him to Kalamazoo, Michigan, where he erected and started the Superior Division of the Bryant Paper Company. Five years were spent in the plant of the Chicago Coated Board Company. In 1900, in company with his brother, George, and the late Colin Gardner, Sr., he became a stockholder in the newly organized Colin Gardner Company, and in 1908 was called to Middletown to erect and

paper stock and its washing and thorough screening before putting it through the refining engine. It increases production, eliminates the tremendous wear and tear on the beaters and Jordans, and furnishes a clean stock fit to make a high grade and uniform product.

The description of Mr. Harvey's stock preparation method will be confined to its operation in the Gardner & Harvey Paper Company, which is known as their Number Two mill. The product of this company is manila lined and news lined chip board, and runs as high as one hundred tons per day, averaging eighty-five, figuring light and heavy weight board on a 124 inch Black-Clawson machine.

The process of stock preparation in this Number Two mill begins in the paper stock room on the second floor of the building where the pulp is prepared. A railroad track is elevated to permit the freight cars to come direct to the door of the second floor room. The handling of this department is in the charge of four men. There are three rotary cookers, 18 feet in length and 14 feet in diameter below the floor, and three men fill one rotary in forty-five minutes. All paper

stock, such as manila, straight news and mixed papers comes to this department and proceeds with few exceptions through the rotary cookers.

Cooking the Stock

The cooking operation consists of filling the rotaries with paper stock and half-filling with warm water. Exhaust steam from the engines is then turned on to maintain a pressure of from two to six pounds for two hours. In this process of cooking, the mixed paper is loosened up and disintegrated into a mass of pulp. Even such materials as sulphite paper roll cores with steel ends are separated in this process, the cores becoming a soft mass of pulp and the steel ends taken out with the refuse. At the end of two hours the steam is turned off and the rotaries are run for another two hours, after which cold water is pumped in until a slight vacuum is formed, followed immediately by a pressure which indicates that the rotary is full. At this point the head is taken off and the contents dumped into a concrete pit. The capacity of each of these rotaries is from eight to nine tons of stock, each requiring eleven to twelve horsepower to drive them, which is supplied by individual fifteen horsepower motors.

Through Settling Tank and Screen

The stock is lifted from the pit by a bucket elevator and emptied into a settling tank having three compartments. By means of baffles, the heavy materials settle in the second compartment and that which floats is skimmed off in the third compartment. At the end of each cook, two men clean out this settling tank and sort the refuse. The policy of the company allows these sorters to salvage the refuse for their own gain and articles as valuable as diamonds have been found.

The stock on leaving the settling tank flows through a riffler consisting of a long box with vertical baffles to catch the remaining sediment and finally passes over a flat screen where the ordinary plates are replaced by steel plates with three-quarter inch holes. The screened stock then goes to a decker, the cylinder of which is covered with a comparatively coarse wire. The pulp as it comes from the decker is very free from grit and all foreign substance, and falls into chests of which there are four with capacity of twenty-five tons each. These four chests enable the storing of different grades of stock. All of the white water from the decker is used to dilute the stock in the settling tank, making a closed system—there is no sewer connection.

The tailings or materials that have not passed through the flat screen are carried over the end by scrapers which travel the length of the screen. These tailings together with the rag and string refuse from the settling tank are taken to the boiler house and burned for their heat value. This is rather sensational from the viewpoint that wet rags and strings would naturally be considered a heat deterrent. Demonstration has proved in this mill, however, that the coal fire is not choked by the admission of this refuse, but on the contrary it gives an increase in heat as shown by the steam chart. Refuse scattered around the mill grounds is conspicuous by its absence.

Board and Liner Through Same Process

Reference has been made to the four chests accommodating different grades of stock. Besides mixed papers going through this system for chip filler, manila papers for lining, box board clippings, as well as straight news go through the same cooking and screening process. There are two screening units entirely separate from each other to enable the running of different grades of stock at the same time. Four men are employed to take care of this department from the rotary pit to the stock chest.

Life of Jordans and Beaters Increased

As needed, the stock is pumped from the storage tanks into beater chests, from which it is Jordaned into machine chests. An evidence of the value of this clean stock in machinery upkeep is shown in the life of the Jordan fillings. They last from one to two years without having to be replaced on account of the knives being damaged from contact with foreign material. Leaving the machine chests as needed, it passes through regulating boxes, of which there are six to correspond with that number of cylinder machine vats. Here the stock is divided between that required for the machine and the balance which returns to the machine chest. That which goes to the machine vats passes in the usual way over .022 cut flat screens, where fresh water is supplied through oscillating showers, and baffles are arranged to accomplish the most efficient screening. The practice of inspecting and cleaning the screen plates weekly is done as a further measure to insure a clean and uniform product.

Three out of five 1,000 pound E. D. Jones beaters are used to prepare liners and the repulping of broke. Clean stock is the answer to the question why these beater rolls now running perfectly true with knives free from blemish have been operating without a change for five years. Four men are employed in the operation of the beater room.

Summarizing the benefits obtained by the Gardner & Harvey Company in preparing their stock in this manner, we find that they are: first, a clean and uniform stock from which to make their board and capable of producing the maximum required strength, high finish and crispness for that class of product; second, a greater production with a much reduced operating force—before installing the system, the output of the mill was fifty tons a day, employing twenty men in the stock preparation process; now an average daily production of eighty-five tons is the output with but twelve men to do the work; third, a contented crew of workers as the result of a clean mill with less work to do, owing to the well organized method and the lack of having to keep continually replacing broken machinery; fourth, a material saving in horsepower and labor per ton of stock produced by this method over that which is generally employed. It is startling to learn from Mr. Harvey that he considers a saving is made by the operation of his process over the usual method from the stock bales to the paper machine of no less than three dollars per ton.

Conference on Wood Utilization

Secretary Wallace has issued a call for a national conference on the utilization of forest products, according to an announcement from the Forest Service United States Department of Agriculture, made public today.

This meeting, which is to be held in Washington on November 19 and 20, will mark the most comprehensive of existing timber supplies ever made in the United States to have the economical use of existing timber supplies take its essential place in the national forestry program along with the prevention of forest fires and the growing of timber crops, declare officials of the Forest Service.

By better ways of manufacture and use the drain on the country's forests can be reduced at least one-fourth, Secretary Wallace states in his letter to 150 representatives of wood-using industries, consumers, the building crafts, and the general public who have been asked to name 2,000 men and women to whom invitations to attend the conference should be sent.

It is planned to have the two-day meeting attended by representatives of both the wood-manufacturing and wood-consuming industries of the country. Newspapers, periodicals, railroads, builders, architects, foresters, forest schools, and the general public will be represented.

Advisory Board to Meet

Although there will not be the usual fall business conference of the American Paper and Pulp Association at Chicago this fall, there will be a meeting of the Executive Committee and Advisory Board at Chicago on October 14, during the convention of the National Paper Trade Association in that city.

This meeting will include the former presidents of the American Paper and Pulp Association, and the presidents of the affiliated organizations, as well as the Executive Committee, which, under the reorganization of the association, consists of five representatives of the industry in addition to the president and vice-presidents.

When it was decided to hold the annual convention of the American paper and Pulp Association in February instead of April, 1925, it was also decided to drop the usual fall conference. The paper merchants, however, through the National Paper Trade Association will hold their usual fall convention.

The Salesmen's Association of the Paper Industry also will not hold a fall convention, but will concentrate its efforts on the big convention in New York the week of February 2, 1925.

"The two National Forests in Alaska," declares J. C. Dort, hydro-electric engineer of the Forest Service, United States Department of Agriculture, in his recent report on water power in Alaska, "can produce about 2,000,000 cords of pulpwood every year for all time under scientific forestry practices. Translated into paper, this means an output of 5,000 tons of paper every day. Excellent water power sites are abundant in southeastern Alaska, the report states.

Three timber cruisers, lost in the woods near Kipawa, Quebec, recently, were picked up on an improved raft in Lake Kipawa near Red Pine Chute. They had been wandering in the bush for two nights and nearly two days without food, but were little the worse for their trying experience.

Pulverized Fuel for the Paper Mill

By C. C. HOCKLEY

AS far as the writer knows, the first complete pulverized fuel plant for supplying steam to a paper mill was put into operation at the plant of the Thilmany Pulp & Paper Co. at Kaukauna, Wisconsin, on January 1, 1924. While other plants have tried one boiler, in an experimental way, this plant depends entirely upon the pulverizer fuel plant for its steam supply.

After an extensive study, by the writer, of several actual units in operation, as well as the different systems and literature on the subject, it was decided to install the unit pulverizer system instead of a pre-drying system. This system takes the coal as it comes from the cars or pile and after crushing it carries the crushed coal directly to the coal bunkers located over the boiler. From the bunkers the coal passes directly to the pulverizer, which not only reduces it to the required fineness, but blows it into the furnace.

While it is not claimed that the burning of the coal without pre-drying gives the greatest efficiency in the furnace, it is the writer's opinion that for plants of 4,000 H.P. rating or under, the excessive cost of a pre-drying plant is not justified and the unit system is the most economical.

The following brief description and the accompanying illustration should give a fair conception of the layout of this plant.

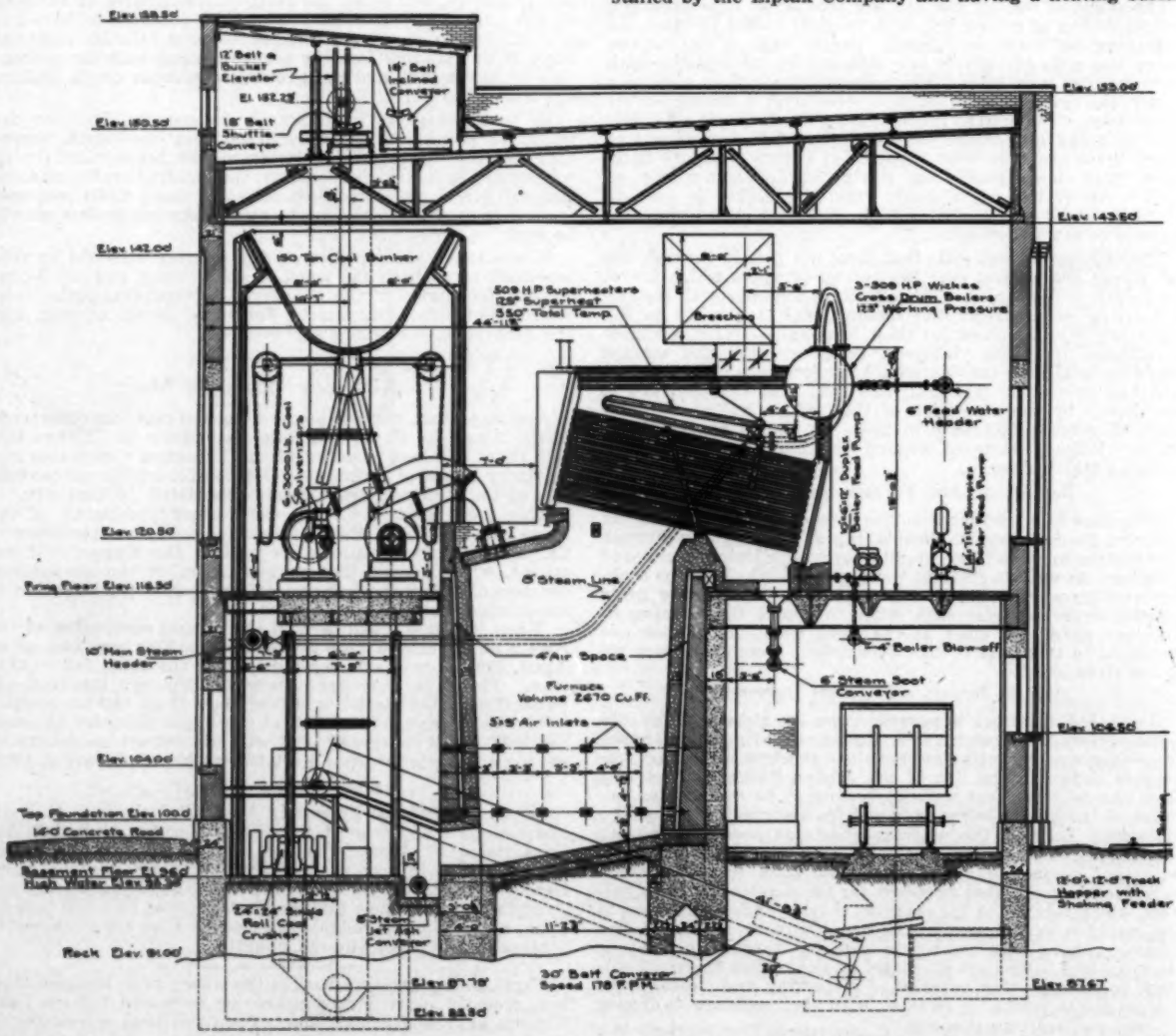
The building is a brick and steel structure, with windows of steel sash, resting on bed rock and approximately 80 feet long by 62 feet wide and 62 feet high from floor to roof. The rock on which the foundation is built has eliminated all question of foundation troubles, and both boilers and building are resting on it.

Coal is supplied from the yard by rail and two cars can be handled inside the building at one time. The coal drops into a hopper and thence over a shaker feeder to an inclined belt having a magnetic pulley for removing scrap iron. The width of this belt is thirty inches and it travels at 180 feet per minute. It carries the coal either to the crusher or by a chute to the vertical bucket elevators.

From the bucket elevator the coal is carried over a horizontal shuttle conveyor, 18 inches wide, traveling at the rate of 260 feet per minute. This conveyor is equipped with a coal weigher and a second magnetic pulley to a concrete bunker of 150-ton capacity.

From this bunker the coal passes directly to the six unit pulverizers which rest upon foundations independent of the building and separated from the building floors by mastic joints.

The main generating units are three Wickes Cross Drum W. T. O. E. boilers, equipped with flat suspended arches installed by the Liptak Company and having a heating surface



Sectional elevation through boiler house of the Thilmany Pulp and Paper Co., Kaukauna, Wis.

of 5,090 square feet each. These boilers are set in one battery of two boilers and one boiler in single setting. They are fed through a feed water meter by motor driven, centrifugal pumps, and are equipped with recording gauges showing boiler pressure, C.O.2, draft, feed water temperature and stack temperature.

The boiler operation is controlled by an automatic Garrick combustion system which controls the draft, amount of fuel and amount of air supplied with the fuel. Ashes and soot are removed by American steam jet conveyors which carry them to a tile ash bin, of 30-ton capacity, located in such a way as to allow the removal of ash by train or truck. The stack is of reinforced concrete and is 7 feet 6 inches in diameter by 202 feet high.

The pulverizers, installed by the Erie City Iron Works, are of 3,000 pounds' rated capacity each, and, while this is ample for one boiler, continued operation is the most necessary point to consider, and to avoid any possibility of shut-down, due to excessive moisture in the coal or trouble with the pulverizer, two of these machines are installed for each boiler.

The pulverizers are driven by 40 H.P. motors but actually operate at 15 H.P. each, and up to the present we have used but one pulverizer to the boiler and have generated from 750 to 900 H.P. each. The coal is pulverized to a fineness of 180 to 200 and any kind of coal may be used.

The furnaces have a volume of 2,670 square feet each and resultant combustion has justified this size, as the coal is completely burned up and the ash contains but ¼ to ½ of 1 per cent carbon.

The walls of the furnaces are but one brick thick and are sloped and surrounded by an air space through which the air of combustion is forced. This results in a cooling effect on the brick and also heats the air needed for combustion.

Our records, which, of course, we hope to improve, show an increased efficiency, over all, of about 12 to 15 per cent, which, with the reduced labor and a clean plant, makes us feel that we have made one step forward.

A new method of thermometer tube construction known as the TAG-Hespe Red Reading Column has been developed. A broad red line shows from the top of the mercury column to the top of the tube. When the mercury rises it covers more of this red line; when the mercury falls a correspondingly greater length of the red line is exposed.

Thirteenth Annual Safety Congress

Held in Louisville, Kentucky, September 29 to October 3, 1924

THE spirit of genuine hospitality could not have been more manifested than displayed by the city of Louisville, Kentucky, to the Thirteenth Annual Safety Congress of the National Safety Council, held in that city, September 29 to October 3, 1924. Evidence of the effort on the part of the Louisville Safety Council to make that a banner week for Safety education was to be seen everywhere. The Council caused 500,000 or more pieces of literature to be distributed into every school, shop and home in Louisville. Probably the most outstanding characteristic of the Convention was the co-operation given bountifully by the daily newspapers, industrial establishments and all the civic organizations. One hundred voluntary delegates to the Council went forth and spoke to gatherings in the shops, schools, community houses, and before merchants' clubs and civic organizations. An impressive parade was held in which there were about 90 floats and thousands of children were in the line of march. Though the schools had been opened but a few weeks, the children had prepared numerous exhibits of safety ideas. These were on display at the Safety Exhibit held in conjunction with the Congress. It is said that no city fails to feel the effect of a visit of an annual safety congress for two or three years following, and Louisville will probably be no exception to this rule.

Aside from the programs of the general session and the sectional meetings, motion pictures on safety were shown every day in the ball room of the Brown Hotel in the hour from 1 to 2 P. M. Two outstanding entertainment features were the informal dance held in the Brown Hotel on Monday evening and the annual banquet on Thursday evening, where speeches, music and entertainment prevailed. There were also many special entertainment features held for the women visitors.

Paper and Pulp Section Meeting

The meeting of the Paper and pulp Section of the National Safety Council was opened on Tuesday morning, September 30, at 10 o'clock in the Brown Hotel, Chairman G. W. Phillips of the Champion Fibre Co., Canton, North Carolina, presiding. There were about 30 representatives from the different mills present. The chairman read his report of last year's progress as follows:

Chairman Phillips' Report

"We have come to the close of the eighth year of the Pulp and Paper Section of the National Safety Council. The Pulp and Paper Section was born at the meeting of the Safety Congress in Philadelphia in 1915. Representatives from thirty-six companies had caught a vision of the star of safety, believed in the great possibilities it offered to the pulp and paper industry, and were anxious to help others who were engaged in the paper business to see the light and join the great army of safety workers in their crusade against man's great enemy —carelessness.

"During the eight years of the life of the Section, there has been no phenomenal growth, although the membership has increased steadily and accident prevention has now become a part of the policy of nearly all of the large manufacturers of pulp and paper, which is an evidence of the real interest the leaders of the pulp and paper industry have in the welfare of their employees.

"It is our desire, however, to see the Pulp and Paper Section at the head of the trade groups doing real safety work. The paper industry is not only one of the oldest, but also one of the largest employers of labor, therefore, it should be among the leaders in accident prevention.

"During the past year, we believe that some progress has been made. The various committees have been active. They have done a good work, and we want to express our appreciation to them and to the National Safety Council for the splendid spirit of co-operation manifested, and the work done during the past year.

Increase in Membership

"From October 1, 1923, to September 1, 1924, thirty-six new member companies have been added to the membership of the Section. Sixteen bulletins were prepared, twelve distributed to members, a splendid program arranged for this meeting of the Congress and a large number of letters and bulletins of various kinds prepared and sent out in the interest of safety.

"As chairman of the Section I want to express my appreciation to Mr. S. F. Shattuck, Kimberly-Clark Company, chairman of the Membership Committee; Mr. R. H. Cochran, The Champion Coated Paper Company, chairman of the Bulletin Committee; Mr. W. A. Gleason, Hammermill Paper Company, chairman of the Program Committee; Mr. S. L. Bush, Crocker-McElwain Company, secretary; Mr. F. H. Rosebush, Nekoosa-Edwards Paper Company, vice-chairman, and the National Safety Council for the work they have done during the year in the interest of the Section. I feel that they deserve a word of commendation from us, for they have discharged their duties faithfully.

"We regret to report a loss of a few old member companies during the year. However, we are glad to report an increase of twenty-three over the previous year.

"On September 1, 1924, the total membership of the Section was 181. Fifty per cent less than it should be, or would be, perhaps, if non-member companies realized the benefit derived from a real Safety First Campaign. No doubt all of the pulp and paper manufacturers who are not members of the Section, are interested in the welfare of their employees, but are not sure that a safety program in an industrial plant pays in a financial way. They do not know that it will reduce accidents, promote team work and help to develop a better spirit among their employees and closer co-operation between employer and employee.

"Those who have tried it are convinced that a substantial saving is effected, aside from the humanitarian standpoint. In other words, it pays in dollars and cents. Therefore we need not hesitate to recommend it to others.

"In closing let me say it is a great pleasure for me as chairman of the Section to welcome you here in the name of the National Safety Council and the Pulp and Paper Section.

"It is well for us to get together at these meetings, exchange

ideas, get better acquainted, gather inspiration for the coming year and rededicate our lives to the cause of safety and the welfare of humanity.

"As we shall work together, employer and employee, for the elimination of unsafe conditions and practices, we are making our factories safe places in which to work and the people who labor in them more careful workmen. Thus by our continued effort we can make 1925 the banner year in accident prevention in the Pulp and Paper Section."

A letter was read from Mr. S. S. Shattuck of the Kimberly-Clark Paper Co., regretting his inability to attend the meeting. Mr. Shattuck was chairman of the Membership Committee last year and reported a net gain of 23 members in the Section.

R. H. Cochran of the Champion Coated Paper Co., Hamilton, Ohio, next presented his report as chairman of the Bulletin Committee, which follows:

Bulletin Board Committee Report

I was appointed chairman of the Bulletin Committee on November 10, 1923, by Mr. Phillips, and although it took some time to get started, we have had a very successful year in getting material for bulletins, thanks to the splendid co-operation of the Committee and Mr. Sandel of the National Safety Council. During the year, Mr. Sandel came to our plant and with the aid of a photographer, we took several photographs.

Seven men from different plants signified their willingness to serve on the Committee and contributed material for bulletins. They were Mr. John Lundrigan of the International Paper Co., Mr. W. J. Peacock of the Northern Paper Co., Mr. Roy Murbach of the Gardner & Harvey Co., Mr. E. A. Weissbach of the Richardson Company, Mr. A. O. Galloway of the Phillip Carey Mfg. Co., Mr. R. W. Ross of the Beveridge Paper Co. The following are the bulletins furnished through the National Safety Council: 1. Hazards in Punching Shavings; 2. Results of Poor Winding of Roll and Consequent Injury to Crane Workmen; 3. Set Smallest Slitter Nearest to Winder Men at the Winders and Rewinders; 4. Use a Paddle Instead of Hook or Piece of Iron to Clear a Blockade on Pulp Shredder or Beaters; 5. Hazard of Unsafe Stack of Papers not Piled Properly; 6. Dangerous Methods of Riding Conveyors; 7. Danger of Putting Hands Between Hitch Rolls and Self to Clean Roll of Stock; 8. Hazard at the Couch Roll on the Wet Machine; 9. Inspecting Railroad Cars Before Loading; 10. Good Housekeeping in Machine Room; 11. Necessity for Using Lifelines When Working in Chip Bins; 12. Safe Methods of Setting Tall Loaded Cases on End; 13. Safe and Unsafe Methods of Piling Pulp; 14. Steps in Safe Way to Operate Digester, is to be furnished by Mr. Peacock of the Northern Paper Mills; 15. Danger of Loading Trucks More than Shoulder High with Paper in the Finishing Room is to be furnished by Mr. Wilkinson of the American Writing Paper Co.; 16. Danger of Being Caught in Last Press of the Wet Machine is to be furnished by Mr. R. T. Higginbotham of the Crocker-McElwain Co. Number 11 was furnished by Mr. Lundrigan of the International Paper Co. Numbers 1, 3, 5 and 6 have been used in the Safety News. Numbers 15 and 16 may have been sent in to the Council, although I have had no word of it. The pictures for numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12 and 13 were taken at this plant by a local photographer and myself, assisted on part of them by Mr. Sandel of the National Safety Council. In conclusion, I wish to state that although getting rather a late start, I think we have made some progress and have enough material for bulletins to last for some time during the coming year.

W. A. Gleason, chairman of the Program Committee, spoke of difficulty in getting members to participate in the active work of the Section. He said that his experience in making up a program of speakers was an uphill proposition and that it was never a sure thing who would attend the meetings. The suggestion was made that in the coming year the members volunteer to the new officers who will attend the next meeting and who will participate in the program.

Digest of Former Proceedings

The first address scheduled on the program was by S. H. Rosebush of the Nekoosa-Edwards Paper Co., Port Edwards, Wisconsin. It was a digest of the annual congress proceedings of the Paper and Pulp Section reviewing papers which had been presented at the section meetings since 1920. Mr. Rosebush stated that there were in all about 26 papers presented, some on safety and others on technical subjects. For one to masticate all of these papers and put them into one would be a task, and the scheme adopted was to get the safety thread in all the papers and credit given to the respective authors. The title of Mr. Rosebush's address was "Some Ways of Putting Safety Across."

Safety Code Discussion

The next number on the program was a round table discussion of the Paper and Pulp Mill Safety Code. In the absence of Mr. R. M. Altman, chairman of the Safety Code Committee, the discussion was led by Mr. John M. Sandel of the National Safety Council.

In opening up the discussion, Mr. Sandel related the progress of this Code work during the past year. It was thought at the Buffalo Congress that the Code recommendations made there did not entirely complete the work and it was decided that sectional meetings be called in different cities where interested persons could discuss the matter further. Meetings were held at Kalamazoo, December 13, 1923, where representatives from most of the mills in that section were present. A meeting held in Glens Falls on March 17, 1924, had a large attendance. On the following day a meeting was held in Holyoke, Massachusetts. Many changes and additions have been made in the Code since the form was published in the February, 1923, issue of THE PAPER INDUSTRY. Since there will doubtless be more suggestions offered in the future, the suggestion was made that revised copies of the Code, brought up to date, be mailed to every member of the section and that within a period of thirty days, all further suggestions should be made so that the committee can go on with their work. It is believed essential that the code be adopted at the next annual meeting and put into the hands of the American Society of Safety Engineers before many of the provisions become obsolete owing to the innovation of new types and designs of machinery.

Safety Code Revision

Following are a list of the paragraphs which have been changed and revised to date, and which, added to those previously published, bring the entire Code up to date. Those insertions which appear in capital letters are the recommendations offered at the Louisville meeting.

Part I. The Yard

Section 10-(c). For wood of short lengths (4 feet) and where tracks will be moved, locate piles of wood so that there will be a clearance of 8½ feet from the center line of the track at the last location of the track.

Section 10-103. Walkways. Walkways shall be kept in good condition. Lighting conditions shall be adequate.

Section 10-104. Warning Signals. Where logs are piled around a curve so that a man in the track cannot be seen by the locomotive engineer when 200 feet away, a warning signal should be provided, consisting of either an automatically operated electric gong or a whistle to be sounded.

Section 10-105. Gang Plank Construction. Gang planks are for use in unloading pulp wood from box cars shall be of sound construction and at least 5 feet wide. The edges should be raised to prevent trucks and other conveying equipment on wheels from rolling off. Where car doors are wider than the above specified minimum width, the doors shall be closed to leave an opening or exit from the car directly on and no wider than the gang plank width.

Section 10-109. Section (e). Handles of pike poles should be made of split wood, preferably hickory or ash.

Section 2. Wood Pile—112. Conveyor Sides. The sides of the conveyor shall be constructed so that the wood will not fall off. For small sizes of wood, the minimum height of the sides shall be two inches; for larger sizes of wood, the height of the sides shall be increased as much as is necessary to prevent wood from falling. A HORIZONTAL PLATFORM SHALL BE PROVIDED UNDER CONVEYORS OVER WALKS AND WALKWAYS, TO CATCH FALLING WOOD.

Section 12. Unloading and Storage of Raw Materials—121 (b). Trucks shall be frequently inspected and maintained in a safe condition. Wheels with broken rims shall be repaired. Nails shall not be used in lieu of cotter pins for holding wheels on axles.

Section 12-122. Clearance. When piling materials inside buildings and on platforms, sufficient clearance shall be allowed for the safe operation of all trucks.

Section 12-129. PROVIDE PLENTY OF WATER WHEREVER ACID WOULD BE HANDLED.

Section 12-129 (c). Unpiling Pulp. Employees shall be instructed not to undermine piles of pulp when unpiling, or to change the general shape of the pile when piled, as specified in Rule 129 (b).

Part II. Preparing Pulpwood

Section 20-200. SCREENS FOR GANG AND SLASHER

SAWS. THE GUARD SHOULD BE PLACED OVER THE TAIL SPROCKETS.

Section 20-205. Conveyor Chains. There shall be devices provided for quick stopping of conveyors.

Section 20-209. Operating Rules. All oiling should be done at stated periods, at a time when all machinery is stopped.

Section 20-206. Single Circular Saws shall be provided with guards specified in the Code for the Safeguarding of Woodworking Plants.

Section 21. Hand Barkers—211. Stops for Hand Barkers. There shall be a positive stopping device for all hand barkers, which can be arranged to be locked disconnected from the power.

Section 21-219 (b). Knives, when replaced, should not be of a different weight from others used.

Section 21-219 (d). Governor. Where a barker disc is directly connected to a water wheel, a governor should be placed on the wheel to control the speed of the disc within safe limits.

Section 22. Barking Drums—220 (a). Continuous Barking Drums. A standard railing shall be constructed around the drum. For details of railing construction, see Safety Code for Floor and Wall Openings, Railings, and Toeboards.

Section 22. Barking Drums—220 (b). Sprockets and chains, gears and trunnions shall be guarded as specified in the Safety Code for Power Transmission Apparatus.

Section 22-221. Intermittent Barking Drums. In addition to motor switch, clutch, belt shifter, or other power disconnecting device, intermittent barking drums should be equipped with a device that will prevent the drum from moving while it is being emptied or filled.

Section 23. Splitters—231. Power Control. Power for the operation of the splitter shall be controlled by a clutch or equivalent device, rather than have the splitter operate continuously.

Section 24. Chippers—241. Chipper Spout. The chipper spout should be at least 36 inches long and the end of it should be protected by either a circular piece of heavy belting fastened over the mouth of the spout, or a swinging baffle (similar to a swing check valve) installed in the spout, to retard blocks flying back from the knives.

Part III. Rag and Old Paper Preparation

Section 30-302. Steels for Sharpening Ripping Knives shall be guarded by leather discs set at the junction of the wooden handle and the steel.

Section 30-303. Containers of Compressed Paper should be used in preference to wooden barrels, etc., to eliminate the hazard of projecting nails.

Section 30-314. Bleach Boiler. The power control for the bleach boiler shall be arranged to be locked while the boiler is being filled.

Section 30-319 (c). Safety Instruction. In feeding blowers, employees should be instructed to use some kind of hand tool and remove all heavy foreign objects, which may injure other persons when discharged from the other end of the duct. In addition, the discharge outlet should be arranged so that material will not fall upon workmen.

Part IV. Acid Making

Section 41-411. Clothing. MASKS SHOULD BE AVAILABLE FOR EMERGENCY CLEANING AND A MAN SHOULD BE STATIONED OUTSIDE IF SULPHUR GAS IS COMING THROUGH.

Section 41-413. Signal System. A signal system should be provided between the acid towers and the acid plant, for use in case men are suddenly overcome with gas while at work. This signal should preferably be arranged so that a bell will ring in the acid plant, and will call a properly equipped rescue party.

Part V. Chemical Processes of Making Pulp

Section 50-503. Blow-off Valves and Piping. The blow-off valves of the digester shall be arranged so as to be operated from the test valve floor, the top floor of the building, or other location outside the digester room, OR SOME POINT REMOTE FROM VALVES. Through bolts instead of cap bolts shall be used on all digester piping. Cast iron, TWO INCHES OR MORE IN THICKNESS, or bronze pipe should be used between the valve and blow pit and the pipe should be inspected monthly.

Section 51. Sulphate and Soda Processes—512. Furnace Room. An exhaust system should be used where niter cakes are fed into the rotary furnaces if hydrogen sulphide escapes into the room.

Section 51-513. Causticizing Tanks. Niter cake should never be added to the smelt dissolving in the tanks.

Section 61. Pulp Shredders and Presses—610. Floor Drains. Adequate drains to remove all excess water shall be provided.

Section 61-613. Roll Guards for Wet Presses. The cleaning of stock from the felts of the machine when running shall be prohibited. An enclosure shall be provided in front of the roll, having an opening so that a stream of water can be directed on the roll, but not large enough to permit the entrance of the operator's hand.

Section 61-614. Pulp Conveyors. Belt conveyors shall have the point of contact of the belts and pulleys guarded at inrunning bites. The guard should be arranged so that all stock on the conveyors will be automatically removed and not require manual handling at the point of contact.

Section 62. Beaters and Washers—621. Beater Dumping Devices. The so-called automatic dumping devices should be installed.

Section 62-629 (a). Operating Rules. Floors. Floors should be cleaned daily to remove water, oil and stock.

Section 62-629 (c). Employees shall not stand on edge or curbs of the beaters.

Part VII. Machine Room

Section 70-702. Emergency Stops. Both the operating and the back sides of the paper machines shall be equipped with devices that will stop the machines quickly in an emergency. The device shall consist of push buttons for electric motive power or electrically operated engine stops, pull cords, connected direct to the prime mover control, etc. The devices shall be tested frequently by making use of it when stopping the machine.

Section 70-703. Hose. Water hose shall be kept out of the center of passageways as much as possible.

Section 70-704. Clothing. Employees in this department should wear shoes at all times.

Section 71. Presses and Dryers—714. Stretch Roll. A ductor should be provided at the stretch roll.

Section 71-715. Levers. All levers carrying weights shall be constructed so that weights cannot slip or fall off.

Section 71-716. First Dryer. Either a permanent railing or apron guard or both shall be installed in front of this dryer.

Section 71-717. Steam and Hot Water Pipes. All steam and hot water pipes, WITHIN 7 FEET OF FLOOR OR PLATFORM, in this department should be covered.

Section 72. Calender Stack—721. Steps. Suitable steps with non-slip surfaces shall be provided at each press, upon which the operator may stand.

Section 74. Rewinders—744. Winder Shaft. In order to avoid the use of ropes, all shafts shall be equipped with a winder collar guide.

Section 74-810. Operating Rule. Machine operators should be instructed never to try to remedy a blockade while the machine is in motion. The machine should be stopped, and the paper should be removed before starting.

Part VIII. Finishing Room

Section 80. Supercalenders—801. Supercalender Rolls. The necks of supercalender rolls shall be enclosed by a solid enclosure extending from the frame of the machine to the production surface of the roll.

Section 82. Cutting and Trimming Machinery—820 (b). Carriers shall be provided for knives of guillotine cutters for safe transportation of the knife.

Section 82-821 (a). On single knife machine a guard shall be provided at the bearing of the knife mandrel to prevent employees' reaching for paper at a point close to the knife, where knife rotates toward the front of the machine.

Section 82-821 (b). On duplex cutters the above protection shall be provided for the first knife if the same hazard exists, and a hood shall be provided for the second knife where the machine has a walk-way.

Section 83. Platers—830. Plater Zincs. Burrs on the edges of the zincs shall be removed.

Section 84. Packing, Storing, Loading and Shipping—849 (a). Truck Loads. Paper should not be loaded on truck to a greater height than the shoulder of the truck operator or helper.

Section 84-849 (b). Hammers. Boxmakers shall be provided with scored or corrugated head hammers.

Second Session

The second session was opened at 10 o'clock, Wednesday morning, October 1, in the Brown Hotel. Following the customary announcements, a very excellent educational address on the subject of "Health Service Work in Paper Mills" was delivered by Dr. Lewis Frechtling, director, Department of Industrial Relations of the Champion Coated Paper Company, Hamilton, Ohio. A copy of this paper is published elsewhere in this issue.

Dr. Frechtling's Paper Creates Discussion

A good discussion followed the reading of Dr. Frechtling's paper, and many helpful ideas were brought out. The question was asked, "What are you going to do when you get back home? Are you going to go right along in the same old way, or are you going to adopt these different policies in your plant?" It was stated by the questioner that those who have not adopted some form of medical supervision for their employees in their shops, it seems, are on the defensive following the knowledge that the doctor brought out in his paper.

Appreciation of the question was given and in discussion the problem of the small plant was brought up, where, perhaps, it would not warrant the expenditure of money for a doctor's services. One representative spoke of the plan being practised at his mill, where a physician is employed on part time. He comes to the plant one hour each day, four days of the week. A full time nurse is kept on the job and she, with the supervising physician, is able to cover all needs. They had gone a step further in the past year by incorporating a new scheme of insurance which includes physical examination. The employees pay for 50 per cent of the examination cost and every one who has come in on the insurance is taking the examination. Approximately 80 per cent of their employees have taken the insurance.

In reply to the question as to the number of people employed by this company, it was stated that there were approximately 600. Opportunity was then taken by a doctor, who was visiting the meeting, to show why it would be profitable to employ a physician in such a plant on a full time basis or double up with some other plant in the same locality.

In reply to the question whether the medical service in the mill should include the wives and children of the families outside of the mill, and this free of charge, Dr. Frechtling recommended that it should not. He said that it is well to confine services to employees in an advisory capacity only, and not in the capacity of giving them drugs or treatment. He further stated that, in his belief, nurses should not go out in the families to do work. They should simply take care of the men in the plant and not force the men to do anything.

Best Safety Stunt in Our Mill

Following this discussion was a round table discussion on the best stunt in our mill, conducted by N. G. Hoyman, safety director, Kimberly-Clark Co., Neenah, Wisconsin.

Mr. F. A. Robinson, of the Niagara Falls mill, of Kimberly-Clark Company, led, in part, as follows:

"I want to say in connection with any safety work or stunt that you may put on, you probably all realize that it is absolutely necessary that your company be back of the movement 100 per cent, and that you have a safety director who carries the work at the bottom of his heart. Then, you must have your foreman with you 100 per cent. You can't do very much of anything without these three co-operating with you.

"In 1923 a series of Safety Contests were started between the various mills of the Kimberly-Clark Co. which are located in Wisconsin, New York and Ontario, Canada. Previous to the starting of the contests the Niagara Falls mill was what might be called the 'company's sore spot,' as far as safety was concerned.

"The Falls mill started in 1921, and for the year 1921 we had 27 accidents. For the year 1922 we had 31 accidents, but for the year 1923, in which we had all the contests, our accidents were cut to 9 for the whole year. You can see from this that contests are profitable.

"We later proposed to the Industrial Relations Group of the Chamber of Commerce to have a safety contest between all the plants of the city. It was accepted—all plants did not enter—19 entered.

"This contest ran ninety days. A prize of a suitably engraved banner was to be given to the winner or winners in case of a tie and their names to be inscribed on a prize cup to be exhibited at the Chamber of Commerce. Three plants out of the 19 came out a tie—coming through the entire contest without a lost time accident. About 10,000 men were involved in the contest. Interest was kept up by the scores of every plant being published in each plant; also by various inter-department contests within the mills and other stunts gotten up by the members of the various factories. Also by the general meetings held at which a review was made of the plant standings and work being done to promote interest.

"Did all this pay? Listen! For 90 days of last year they had 198 accidents as against 47 during the 90 days' contest of this year, a reduction of 151 accidents, or an improvement of 76¼ per cent, and every plant entered made an improvement over its last year's record. As a result, it is planned to hold a city-wide contest each year."

Employees Given Guide Books

Mr. R. H. Jennings, of the Eastman Kodak Co., Rochester, New York, made the following remarks:

"You all know that we employ several thousand men. It is our custom when a man comes in to work to call him to the committee room after he has been there a day or two and give him one of these little guide books, and in that little guide book it tells him what we expect of him. If he does not want to live up to what is in the book, we do not care to have him work for us.

"Ten years ago we used to have about 110 accidents a year. Last year we had 23. And, gentlemen, I want you to take into consideration that we have 225 punch presses in our factory, and those men have to go in there 20, 30 and 35 times every minute in the day, running 1,600 pieces an hour,—you will all agree with me that there is more danger in a punch press than almost anything else. We have got those men so educated that they won't take any chances; whenever there is anything wrong they go at once and report it to their foreman."

Wax Figure in Cage Idea

Mr. W. A. Gleason, of the Hammermill Paper Co., Erie, Pennsylvania, described some of their stunts as follows:

"Another stunt, after you have received suggestions from the employee, we have a special department working directly under the safety director, composed of a foreman and three men who do the safety work. When an employee brings in a report, for instance that a board is loose in the floor and needs nailing down, the safety inspector (director) immediately gets in touch with the foreman. He doesn't take it up with the superintendent and wait for a week, but he gets results the same day. The employee who makes the report in the morning knows that it will be given immediate attention.

"Another stunt put on in connection with the safety campaign we had in our plant in March: We had a wax figure dressed up and placed in a cage in the time office where the employees could see it when they came in. Inside of this cage we put a sign, 'No Accident,—In for 30 days,' which was the length of our campaign. We had an accident in about 10 days caused by an employee who did not think a slight injury was enough to fill out a report on, and an infection developed over Saturday and he didn't come to work on Monday. We took the wax figure out of this cage and placed it in the department where the man worked. It had a wonderful effect on the rest of the employees. One of the men in that department came to me and said, 'You get that damned thing out of this department and don't let it come back.' That is the way they all felt,—they didn't want to see that wax figure in their department."

A Safety Budget

Mr. Wm. Battison, superintendent of the Champion Fibre Company, Canton, North Carolina, said that they have a budget that is passed at the beginning of the year for the attention of the superintendent and management, and they are trying hard to live within the budget. They are giving special attention to safety—more so than they used to.

Safety Up to Foreman

Mr. Seth L. Bush, of the Crocker-McElwain Co., Holyoke, Massachusetts, said, in part: "We had for some time inspections among our workmen and we made some improvement in accident reduction. We finally felt that we could keep up the interest among our workmen, but we weren't getting along as fast as we wanted to, and so we put the matter of safety inspection directly under the supervision of each foreman in his own department. Regularly, I think it is every two weeks, he gets a questionnaire which covers many of the points of safety protection in his department, and it is his duty to fill it out and he cannot fill it out honestly without really inspecting his department. If our safety engineer finds anything in his department that he has missed, then there is trouble.

"This has worked to eliminate accidents and to keep matters straight in our plant, more than the inspection work by the employees themselves. Our accidents have dropped off more than 50 per cent this year, since we have adopted this scheme."

Team Contest Within Mill

Mr. J. T. Goersler, of the Kimberly mill, of Kimberly-Clark Co., described one of their successful ideas. He said

in part: "Commencing January 1 of this year, the Kimberly mill was divided into two sections of about 435 persons in each. Each section elected a chairman through its foremen and each side took a section color, namely, green and yellow. During contests, of which the third is now in progress, there takes place once each week in the club house near the mill a one-half noonday safety program. One week the greens stage a program, and the next week the yellows. "These programs are nearly always staged by members of the green or yellow groups themselves and consist of musical numbers, singing, dancing, acrobatic stunts, etc., but each program has a safety idea interlaced, being a three-minute safety talk by a member of the group or a demonstration of first aid work. In this way safety is constantly being placed before the men in a new way, and the attendance at these programs is such that it is an indication that they like it. These programs are also largely attended by the worker's families and residents of the village who do not work in the mill.

"We always found the men and girls glad to appear on programs and give their best, as the Greens believe they are staging the best programs and so do the Yellows. Group spirit is strong; it is not personal. This spirit might be likened to the spirit existing in a college—they try to outdo each other within, but stand solid against any outside.

"Sometimes the idea prevails that if a man is continuously concentrating on safety that production suffers. We have found the reverse to be the case, for, with the bettering of our Safety record there has been an increase in production and better quality with less men. Working under satisfactory safe conditions cannot help but make more satisfied employees and with better morale."

The 100-Year-Old Safety Man

This paper was followed by another from the Kimberly-Clark Company, Mr. F. W. Johnson of the Niagara mill, who said in part: "We have a plan in the Kimberly-Clark Company's organization known as the 100-Year-Old Safety Man (a sort of mythical term) and is explained as follows: Every man in a department whose safety man reaches the age of 100 years, receives $5.00 and a safety watch fob. In determining the age of your safety man, you multiply the number of men in the department by the number of days the department has gone without a lost time accident, which gives you the man day record. Then divide this result by 310 (which constitutes a working year) and you will have the age of your safety man. The 100-year-old safety man is equivalent to one man working 100 years without an accident or 100 men working one year.

"When you have a department of 30 to 80 men and the age of your safety man has reached around the 60 year mark, the men start to figure the number of days before they will receive the $5.00 and in this way safety first is constantly before him. Each man is doubly careful that he is not going to be the man to get hurt and spoil the record and deprive the rest of his fellow workers from receiving the $5.00. The main advantage of this plan is this—the men soon take a personal pride in their record and they make sure that they are not in for a razzing, so to speak, from their fellow workers in case they should get injured through their own carelessness, because they certainly would get one.

"With a crew of from 65 to 100 men, we went 999 days without a loss time accident to reach the 200-year-old Safety man and the second $5.00, and up to date we have gone 1,026 days without an accident.

The Red Spot Game

"Our employment manager has started another stunt in what we call the 'Red Spot Game.' We are going to take where we had our last year's accidents and paint a red spot. Of course when the new men come in, they will ask what it is, and the fellow workers will explain what it is, how the accident happened, and how it could have been prevented. In this campaign we haven't yet gotten to the point where we are telling the men anything. When we began to put the red spots down, the men were wondering and commenced to watch, and in a few days we put down a few more red circles. We have got them guessing. There isn't a man that is not guessing something; somebody calls it an "unsafe place," and they have other things they are guessing. We have got the men interested, and we think it is going to be successful."

Stunts at the Mead Paper & Pulp Co., Chillicothe, Ohio, were described by L. O. Bonner and Ernest Augustus. Mr. Bonner said: "We have tried one plan that has given us quite a good deal of success, in finding places that are not safe around the mill. We have a regular form posted at the various departments in the mill that the men can use to turn in a suggestion on, either on safety or improvement; and, if the suggestion turned in is of any benefit, either for safety or improvement in the produdction, the men are paid for such suggestions. We have a minimum, I believe, of $4.00 on safety suggestions, up to $10.00, according to how hazardous the condition seems to be, to the operating committee. We also make regular inspections every two weeks by a special committee, and at times they go over the entire mill and turn in suggestions to the management."

Election of Officers

Before adjournment, the following officers were elected for the ensuing year: M. G. Hoyman, Kimberly-Clark Co., Neenah, Wisconsin, chairman; Norman S. Stone, Wausau Sulphate & Fibre Co., Mosinee, Wisconsin, vice-chairman; W. J. Peacock, Northern Paper Mills, Green Bay, Wisconsin, secretary.

Health Service Work in Paper and Pulp Mills*

By LOUIS FRECHTING

Director, Department of Industrial Relations, Champion Coated Paper Company, Hamilton, Ohio

HEALTH service work in paper mills does not vary from that in other industrial fields. The underlying principles are the same. They are based upon the fact that health denotes mental, moral and physical well being and that it therefore is the basis of efficiency. Health service has a part in selecting the worker for a certain job, based upon his physical and mental fitness to do the work expected of him, and, often, when he has been placed on the job, health service has a part in maintaining his health by removing or safeguarding such hazards as may jeopardize health or limb. For the purpose of this study we may subdivide health service work into medical service, surgical service, dental service, nursing service, sanitation.

Medical Service

Medical service may be made to include physical examinations of all new employees with periodic re-examination for all employees, clearance of all employees who have been absent from work, medical attention to all employees who care to avail themselves of the opportunity, medical advice and instruction.

The introduction of the majority of workers in a plant to health service comes at the time of their physical examination. If "first impressions are lasting impressions," it behooves the physician who makes the examination to make that impression favorable to not only the health service of the plant but to the entire organization as well. A few minutes taken at this time will often accomplish much more than one can hope to accomplish later. The new employee has a right to know why you are making an examination. If he is rejected he has a right to know why he is rejected. If he has a defect of such magnitude that he should protect himself, he should know of that defect, and what he should or should not do. He should know that physical examinations are made only as an adjunct to placement. He should know that when you hire him and place him on a job you are considering not only your duty to him but also your duty to your other employees, the management, your customers and to society as a whole. A man requires work in order that he may discharge his economic and social debts to society. But, in accepting work, he should not be asked to accept employment which will aggravate existing defects or cause new ones or which is beyond his mental and physical power to accomplish. Those whom he will work with have a right to expect that the new employee be free of any infectious or contagious disease, which they might contract. They also have a right to expect that the new employee be physically fit to do the work expected of him lest a portion of it fall to the lot of those who are employed with him. The employer has a right to expect that the new employee will by physical and mental make-up be able to perform the task assigned to him and so remain a contented and safe worker at the work which is his to do.

Physical examination as an aid to placement is a great factor in stabilizing plant turnover. Fear is a great deterrent in industry. Place an employee at work which he is physically and mentally unable to do and at least one of two things is likely to happen: either your employee will leave or he will get hurt. Fear will be the cause in either case. In our own organization we have had several experiences which have sold us the value of the physical examination. For a long time we

*Presented at the meeting of the Paper and Pulp Section of the National Safety Council, Louisville, Ky., October 1, 1924.

had the experience that most paper mills have had with super calenders. There was scarcely a month that we did not have one or more men off because of crushing injuries to their fingers. When we began our work in industrial relations more than five years ago, the employment, production and medical service got together and determined upon the ideal type of man for calender work, as well as other work. That type of man is now employed if it is possible to get him, and our experience so far as mashed fingers from calenders are concerned is a thing of past history. It has now been more than a year since we have had a calender injury.

Typical Procedure

During the time we have been operating our medical department has made 8395 physical examinations. We have had but few who have objected to the examinations. It is our procedure to classify all of our men and women in one of four classes. Class (A) are those who have no physical defects which we can discover. Class (B) are those who have slight defects but none which would make them a hazard on any job in our mills. Class (C) are those who have defects which are of sufficient magnitude to require that they be placed on certain definite limited work. In this class we place hernias, defective vision up to a certain degree, heart lesions which are compensating and the like. Class (D) is our rejection class. Making up this latter class are those with infectious or contagious diseases, those with heart and kidney dieases in the advanced stages, those with defective vision beyond a certain degree and finally those afflicted with venereal infections. In our own experience this latter class runs about 2.5 per cent per year of all applicants examined. If, however, one considers that those who have infectious and contagious diseases, venereal diseases and the like, may again return for examination when free of their disqualifying defect, it will be seen that this class may contain potential employees and the percentage above given reduced at least 50 per cent.

In making the examinations the examiner and the prospective employee should be alone. The examiner should have before him the experience record of the employee. This will give him information as to the previous industries in which the candidate has worked and advise him as to certain industrial diseases for which he should be particularly on the lookout. A complete examination can be made in from 15 to 20 minutes in most cases. Re-examinations can be made in a shorter length of time. It is our practice to require all employees in Class C to return for periodic re-examination, the frequency depending upon the defect. All other employees are not required to return for examination but are encouraged to do so. We have been recommending at least one re-examination each year. The ideal procedure is to have a woman physician for the women employees and a male physician for the men. At present, our own examination of the women in our employe, outside of a careful examination of special faculties and the chest, is merely an inspection.

The medical department should issue clearance to all employees who have been absent from work because of sickness. This will do much to keep down the possibility of epidemics within the plant or in certain departments. If this can be done it means much to the other employees, to the industry and the community as can be readily seen.

In our organization, we render medical service gratis to those who wish to accept the same. The service is offered. The employee accepts or leaves it as he or she sees fit. We find that more and more of our workers are coming in for medical service and advice. This advice does not always pertain to themselves but to their families as well. A well functioning medical department may be of excellent service to the medical profession in the community in just this way. There is no occasion for any clashes such as are heard of between medical service in industry and medical service in the community.

Preventive medicine, a term so new as to be still unknown by many informed persons, should be a part of the duties of every well funtioning medical department in the paper industry. We must recognize that we have certain processes which may lead to diseased conditions. These processes are such as mixing and making chemicals, sorting of paper and rags, cutting of rags, grinding, beating and shaking of rags and papers. Anything that can be done to make these processes safer—so far as life, limb and general comfort of the employees, should be carried out. Of this I shall have more to say later. A medical department or any other that does not have a plan of education in its program is only functioning about one-half. Teach by precept and by word. Organize classes, if you can, to instruct your men and women how best to take care of themselves and their health. Use bulletins carefully selected for use on your bulletin boards. Change them regularly. Have your employee thinking: "Well today is Tuesday—we will have a new health bulletin." You can never tell how far this influence may carry. Our organization is in possession of a letter from the health commissioner of our city stating that he is certain that the health work carried on in our mills has had an influence upon the entire community.

Surgical Service

Surgical service usually has to do with such surgical attention as is required by those who have been injured while in the course of their employment. The surgical and medical services are conducted as a unit. Their location should be as central as possible and the establishment of first aid stations throughout departments are to be considered as unsatisfactory. What little time is gained by rendering service which is often well intentioned but poorly rendered is entirely lost in subsequent developments in many cases.

Early and competent diagnosis will have a pronounced influence upon the final results in the case. It should always be the one aim in this service to return the injured workman to industry in as nearly a normal condition as possible.

More and more are we appreciating that we have a duty to perform in reclaiming our industrially maimed for industry. There is known to most of us some who because of injury have been lost to industry and who through some operative work, exercise or physical therapy might be remade into useful and contented employees. Much can be done along this line and unless the problem is openly met, surgical service in industry is not fulfilling its obligations.

Dental Service

Dental service as a part of health service should deal entirely with two phases of dentistry, dental prophylaxis and dental first aid. But few organizations in the paper industry have full time doctors of dentistry. Most service of this kind is offered on a part time basis. The work of the dentist is limited to prophylactic work, the cleaning of teeth and the rendering of first aid in cases of aching teeth. It is the practice to, if at all possible, clean the teeth of the employees at intervals of not more than six months and at that time to recommend such further treatment as may be required. That this does bring returns to the organization offering the same may be appreciated when one reviews the ills that may come from infected teeth and poorly masticated food.

Nursing Service

Nursing service as a branch of health service may be considered under two headings, the intra-mural nurse and the visiting nurse. The intra-mural nurse might be also designated as the first aid room nurse. She is the right arm of the plant physician. Her duties are to assist in all first dressings, to make the subsequent dressings in the minor cases, to make and properly sterilize such dressings as are used in the work, to keep records and to assist in the educational work of the department, by giving talks to the female employees at various times. I need not advise that the employment of any nurse to work in industry is to be given more than passing consideration. Personally, I consider a good nurse of the highest importance. The industrial nurse must have more than a good technical education and training. She must be democratic; that is, she must be willing to remember that she is a fellow-worker—a neighbor and friend. She must be willing to work, not so much *for* industry as *in* industry. She must be able to understand that she is to work not so much for the worker or her employer as with and through them. She must understand something of sociology and economics. She must be sympathetic, not with a maudlin sympathy, but with understanding. She must be willing to listen to the gossip of the workers which often grows familiar, and so in this way understand the wishes of those with whom she is in contact.

The visiting nurse represents the company, in many cases, to the employee's family and acts as the connecting link between the health service of industry and the home. She must be a woman with all of these attributes which I have named above. She is to be considered more of a social worker than as a nurse. It is true that many large industries do have their nurses do the actual nursing. However, the ideal way seems to be to turn over that phase of the work to the local nursing organization if there be one.

As the scope of the visiting nurse's work is so broad, it can only be outlined. She is limited only by her time and her initiative. Upon her visit to an absent employee she may find the employee sick and without a doctor. The case may be more serious than the family considers it to be. The nurse can make the patient comfortable and advise him to call a physician. If he is a stranger and without knowledge of a capable doctor, she may advise him of several who would render him proper service. If, after the doctor's call, it seems advisable to remove the patient to the hospital, she can make

arrangements to have him taken there, and often accompany him on the trip.

If, as so often occurs, the wife is sick and the husband unable to go to work because there is no one to do the housework and to take care of the children, the nurse will arrange to have someone to do this work and to have the regular nursing organization render the proper nursing service. So, at the time when the employee may be most in need of his income, he is able to be on the job and earn it.

Sanitation

Sanitation is preventative medicine. It has an important place in health service in any industry. It has been defined as the service "which deals with the control of the external factors of environment which affect the health of the workers." These factors are ventilation, temperature, lighting, drinking water, humidity, sanitary appliances and dust.

The planning of proper appliances to meet these various factors will be a joint duty for the medical and engineering departments. The erection and maintenance in good operating condition will fall upon the engineering department. The study of its efficiency, the maintenance of cleanliness and the checking of its effect upon the health of the worker, are sanitary duties which fall to the lot of the health service and rightly so.

In carrying out this work in most organizations, the regular routine work connected with sanitation is delegated by the chief medical officer to one of his staff. The employee will be directly responsible to the physician in charge and should have control over the sanitary corps which may be organized as the conditions in the individual plant may require. These men will have as their duties the cleaning of the plant and the various offices, toilet, locker and bath rooms, the care of cuspidors if such a service is maintained.

At this point I want to say something about plant cleaning as so often carried out. It is done in a rather perfunctory way and then a large amount of some coal tar disinfectant mixed with water is thrown about in a hit-and-miss fashion. As a result of the smell, the employees for the most part get a false sense of security and often ill results follow. It must be borne in mind that no destruction of bacterial life will result unless the agent used for the purpose come into actual contact with the bacteria. There is no better germicidal agents than fresh air and sunlight. It is our own plan in caring for toilets to clear up all of the paper and litter which might be upon the floor, then to thoroughly wash down the floors with a hose, being particularly careful to get into the corners. This, in turn, is followed by the thorough mopping of the floor with hot water. We give each toilet one such treatment a day and are able to keep them in a condition free of disagreeable odors which result from the decomposition of bodily excreta.

The problem of promiscuous spitting is always one of the health problems which requires attention. Most of you are acquainted with the various makeshifts which will appear about the plant for use as cuspidors. Nail kegs, boxes of all descriptions, any kind of a container that is handy or meets the fancy of the employee. We have adopted a renewable cuspidor which has a container board cone which sets in a metal frame. This cone is partially filled with moistened sawdust. These cuspidors are scattered throughout the entire plant and are renewed each day. The man who has this duty to perform has a wagon which he can move from place to place. In one compartment he has the sawdust and new cones in the other compartment—space in which to throw the used cones. At the completion of his rounds these used cuspidors are destroyed by burning.

Particularly should we give attention to the ventilation of our plants. If a number of persons breathe air which is not renewed regularly, chemical changes take place in the atmosphere which lead to an increased amount of carbon dioxide and a lessened amount of oxygen. Physically, the air increases in humidity and in temperature. As a result, those breathing it become dull, have a sensation of "stuffiness," notice an unpleasant odor and sooner or later have an increasing headache due to the toxicity of the atmosphere. As a result, lowered efficiency and a condition prejudicial to health exist. Ventilation corrects this condition as it reduces abnormal heat and humidity, brings in the requisite oxygen and acts as a stimulant and thus makes for better working conditions and better and more product.

Light

Light will receive considerable attention from the physician working in the paper industry. The fact that paper making is a continuous process necessitates that proper lighting be furnished in order that the interest of all parties to the making of the product may be safeguarded. Most states have worked out codes for proper lighting. The National Safety Council has recommended a code. We should remember three principles in artificial lighting. These are: absence of glare, distribution and intensity. Intensity can be measured and partially controlled by seeing that the lights are properly maintained: new lamps to replace those which have burned out, cleaning lights and reflectors, painting the walls in some light color in order that the light rays be not absorbed from a dark dingy wall. Distribution means proper placement and a proper number of lamps. Glare can best be controlled by the proper hanging of the fixture, proper placing of the shades and the use of the proper type of reflector.

The importance of a sufficient supply of cool, clear, clean drinking water is self-evident. As most mills have their own water supplies, the physician in charge should make or have made regular test of the water. Bacteriologic examinations are sufficient. If there is any question as to the purity of the water, chlorination should be immediately resorted to.

The type of drinking fountain is important. The modern fountain with the side jet outlet so placed that it is impossible for the drinker to place his lips over it and also that no water from his mouth may fall into it to contaminate it, is the desirable type. Water should be of a temperature of 50 degrees when possible. Warm water nauseates, while water that is too cold will cause stomach and bowel troubles. Outside of the dust which one finds in the rag and paper sorting departments in varying amounts, the dust hazard does not exist in most mills.

A Study of Flax Straw for Paper Making *

By JOHN D. RUE,[1] SIDNEY D. WELLS[2] and E. R. SCHAFER[3]

This paper, prepared by the Pulp and Paper Section of the Forest Products Laboratory, Madison, Wisconsin, will be presented at the meeting of the Technical Association of the Pulp and Paper Industry at Buffalo, October 14 and 15. Following is a synopsis of the conclusions derived from the study of the subject:

1. *Flax straw in its entirety can be cooked with sodium hydroxide and sodium sulphide solutions to produce bleachable pulps with yields of between 40 and 50 per cent, suitable for the manufacture of greaseproof paper, tissue, and similar products where the properties peculiar to flax serve to advantage.*

2. *Excellent grades of writing, ledger, and similar papers may be made from pulps obtained by cooking fine or medium flax tow with solutions of sodium hydroxide and sodium sulphide, sodium hydroxide and sulphur, and sodium hydroxide, sodium sulphide and sodium sulphite. The cost of the resulting pulp, however, is prohibitive unless some use is found for the towing waste.*

3. *Bank-note and currency paper require the pulping of bast practically entirely free from shive in order to produce a pulp having sufficient purity, strength, and toughness. The mechanical appliances thus far used have failed to separate the bast satisfactorily with economy.*

4. *The waste from the towing of flax may be used to advantage in combination with waste paper and wood pulp in the manufacture of container board or similar products.*

5. *The use of flax straw in products where it excels and the use of both the tow for finer papers and the towing waste for board products may prove the economic solution of the problems of realizing a value from the enormous quantities of flax straw now wasted.*

THE rather lively interest manifest at present in the possible utilization of flax straw for paper makes it seem desirable to publish some recent results obtained at the Forest Products Laboratory, even though the work is as yet far from complete. It is felt that this information may assist in estimating the feasibility of projects frequently proposed

*Acknowledgment is due R. H. Grabow, who carried on prior to September, 1923, a considerable portion of the investigation here discussed, and B. S. Summers, who has acted in an advisory capacity. Every member of the Pulp and Paper Section has been called on from time to time in carrying on various phases of the investigation.

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and may save other investigators the necessity of covering the same ground.

Object

The investigation was undertaken with two objects in view:

1. To relieve the chronic scarcity of linen rags for the manufacture of bank note, currency paper, and other high-grade papers for which great toughness, resistance to wear, and other characteristics obtained by using linen are desired.

2. To aid in preventing the large waste of a potentially valuable raw material now taking place annually throughout the Northwest on account of failure to use more than an insignificant amount of the flax straw obtained in the growing of flax for linseed.

To one not familiar with the subject, it would seem most incongruous that a fiber for which there is an urgent need in paper making should be burned or allowed to rot in the fields each year to the extent of over a million tons of straw, but such is the case; and the reason lies in the fact that while known methods of purification without injury to the fiber can be employed when a relatively very high-priced material such as a textile fiber is the object, the price which the paper manufacturer can pay will not cover the cost of the operation. The quality demanded in linen rag papers is such that no processes can be used in which the "bast" fiber is in the least weakened, and yet the presence of woody or other matter not bast must be avoided. For this reason only linen rags or clippings from the manufacture of linen articles have been used in this grade, since thereby, at only the price of rags, the benefit of the expensive purification given the textile is obtained. In addition to rags and linen clippings there are available for appropriate grades of paper the wastes from the scutching, spinning, and weaving mills, all highly refined products in comparison with the original flax straw.

Besides bank note, currency, and special writing papers, however, there are grades such as cigarette paper, electrical condenser and insulation papers, and counterboard, in which certain amounts of linen fiber are desirable. All these products command an enhanced price on account of the special characteristics required, and it is obvious that in their manufacture the utilization of the straw would seem most advantageous. Nevertheless, little commercial progress in this direction has as yet been made.

The culture of flax in the United States is primarily for the production of seed. When grown for seed the plant is allowed to branch and is shorter and bushier than when grown for its fiber. In the latter case branching is prevented and a long single stem is produced. This difference results in a greater proportion of woody material and knots ("shive") in the case of seed flax, which renders the straw unfit for textile purposes. Its only utilization of any consequence at the present time is in the manufacture of tow for upholstery, coarse rugs, and heat insulation material.

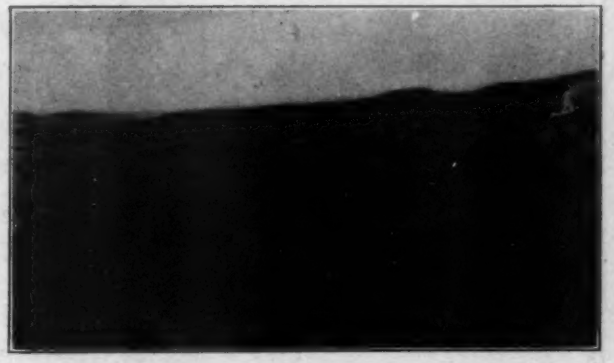
At present only 200,000 tons of the straw are purified annually for all commercial purposes. The remaining one million tons are burned, and the fiber is a total loss.

Location of Flax-Growing Areas in the United States

Collection of the flax straw is somewhat simplified by the fact that the material is grown in a fairly localized area. Table 1 indicates the area under cultivation and the amount of straw available in the United States as a whole and in the several states where extensive cultivation is practiced. This information is taken from reports by the Bureau of Census and the Department of Agriculture. The total area under cultivation in the year 1909 was 2,083,142 acres as compared with 1,260,687 acres in 1919, or a decrease of 39.5 per cent in the decade. In 1920 the acreage was 1,757,000; in 1922, 1,341,000. This decrease may be attributed to economic and agricultural causes, the chief of which was the decrease in the development of new land.

The principal production of flax straw takes place in states in which there are few or no paper mills.

Although the cultivation of flax is waning, the need for additional supplies of seed is acute. A large portion of our consumption is imported. In 1921 imports into the United States were 13,632,073 bushels, while domestic production was 8,029,000 bushels. Up until 1908, however, instead of being an importing nation we exported from 4 to 6 million bushels from a production ranging between 25 and 30 million bushels annually. The linseed oil industry is alarmed at the outlook and undoubtedly would whole-heartedly support any efforts to make the crop more valuable. An outlet for straw at a profit to the farmer would tend to stabilize the cultivation of flax and remove the causes for its migratory character. With the establishment of paper mills or at least pulp mills in flax-growing areas and with co-operation between the farmer and the manufacturer, in much the same manner as prevails in the beet sugar industry, better yields of straw of better quality could be profitably produced, and the mills could count on a regular and sustained supply within a short distance of their sites.



A typical field of harvested flax in Wisconsin, August, 1924. The crop is grown for the seed. The straw is largely a waste that is burned

TABLE 1.—AREA DEVOTED TO FLAX CULTURE IN THE UNITED STATES. THE AMOUNT OF STRAW PRODUCED MAY BE ESTIMATED APPROXIMATELY BY ASSUMING THREE QUARTERS OF A TON PER ACRE.

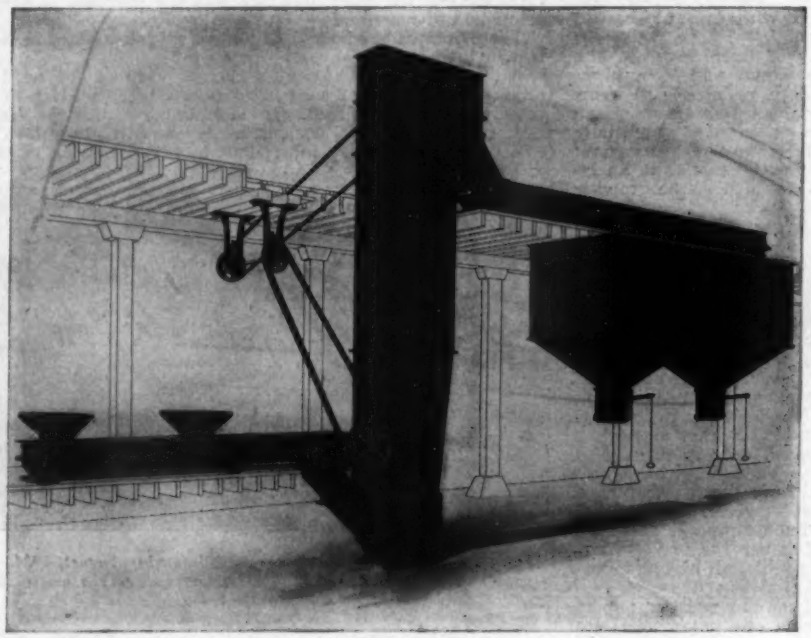
	1899(1) Acres	1909(1) Acres	1919(1) Acres	1921(2) Acres	1922(2) Acres	1923(2) Acres
Michigan	883	216	1,297	.....	.....	.....
Wisconsin	11,263	9,422	7,133	6,000	4,000	5,000
Minnesota	566,801	358,426	288,240	314,000	310,000	527,000
Iowa	126,453	15,549	9,646	8,000	8,000	9,000
Missouri	100,952	20,630	395	.....	.....	.....
North Dakota	773,999	1,068,049	649,949	430,000	521,000	1,094,000
South Dakota	302,010	518,566	159,234	216,000	162,000	284,000
Nebraska	7,652	2,934	1,344	3,000	3,000	4,000
Kansas	192,167	45,014	12,368	20,000	20,000	24,000
Montana	16	37,647	128,851	110,000	84,000	110,000
Wyoming	.....	1,110	1,208	1,000	1,000	1,000
Washington	149	1	91	.....	.....	.....
Oregon	2,016	38	250	.....	.....	.....
Total United States	2,111,000(2)	2,083,000(2)	1,503,000(2)	1,108,000(2)	1,113,000(2)	2,061,000(2)

(1) Statistics obtained from the Bureau of Census.
(2) Statistics obtained from the crop reports U. S. Department of Agriculture.
The maximum area devoted to flax was in 1912 when 2,851,000 acres were reported in the United States.

Composition of the Straw

From the standpoint of the paper maker the valuable portion of the flax is the bast fiber occurring between the cambium layer (which surrounds the central wood or pith) and the epidermis or outer coating of the stem, also called the cortex or bark. In volume or weight the pith and cambium layer comprises from 75 to 80 per cent of the total, the bast from 15 to 20 per cent, and the cortex from 5 to 10 per cent. The bast when removed by breaking the other portions to dust will usually come out in long filaments, sometimes as long as the original stem. This is the state of the fiber known as "tow." The ultimate fiber varies from 1¼ to 1¾ inches in length and from 1/800 to 1/1000 inch in diameter.

The filaments consist of bundles of fibers with their tapering ends overlapping slightly and cemented together by means of pectose, a gummy substance soluble in dilute alkalies. In



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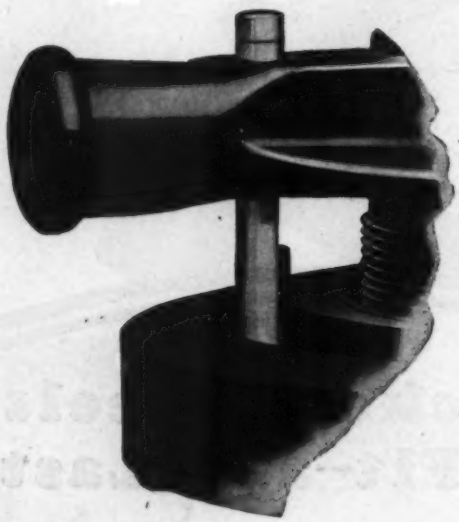

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any adequate pulping operation the pectose is dissolved and the bast is reduced to its ultimate fiber. The remainder of the stalk consists of cells varying in diameter from 2/3 to 6/100 of their length. Such material, referred to hereafter as "towing waste," is of little account for imparting strength to paper, but it can be bleached if cooked under proper conditions and so, when clean and of satisfactory color, would have as much value as china clay for paper making purposes. The bast differs from the rest of the stalk not only in physical characteristics but also in chemical composition. Analyses of bleached and unbleached linen, unspun flax fiber, and the woody portion of the stalk carefully separated from the bast by hand are indicated in the following table:

CHEMICAL COMPOSITION OF FIBER FLAX IN VARIOUS STAGES OF REFINEMENT

Form of material.....	Lignin Per cent	Pentosan Per cent	Cellulose Per cent
Scutched fiber	6.4	2.1	92.5
Unbleached linen cloth....	5.7	3.1	93.0
Bleached linen table cloth	.15	...	100.01
Woody portion of stem..	27.1	22.2	47.2

The data show that the bast is very high in cellulose, even in the unbleached state, and comparatively free from lignin or the pentosans. On the other hand the woody portion contains less than four-fifths of as much cellulose as wood, is high of lignin, and is very high in the pentosans.

In the raw material the bast fiber is associated not only with a great amount of woody matter from the stem but also with the chaff from the seed and, under the usual methods of cultivation in the Northwest, considerable quantities of weeds, cereal straw, burrs, seeds, etc., which greatly aggravate the difficulties encountered in isolating the bast.

Methods of Disintegrating the Straw

The methods that have been employed in disintegrating the straw of seed flax for paper making may be classed as mechanical or chemical operations or a combination of the two.

The mechanical methods consist of a first dusting to remove chaff, litter from dried leaves, and similar material; towing or crushing the stalk between pairs of revolving fluted rolls; and a second dusting out of crushed woody matter to obtain the bast as clean as possible, at which stage it is known in the trade as "fine tow." They only bring about a partial separation, so that it is impossible to get a tow containing less than 50 per cent of woody matter without excessive loss of bast in the shive which is dusted out. Towing tests with a Winona break conducted at the plant of the Union Fiber Co., at Union Grove, Wis., in January, 1923, illustrate the point. The break consisted of eight pairs of fluted rolls operating at 114 r.p.m. and one picker roll at 120 r.p.m. The straw was from seed flax grown at Mayville, Wis., in 1917 and has been baled without dusting. Before being fed to the machine it was dusted to some extent by shaking up with a fork. The yields of tow obtained, however, are based on the original weight of baled straw. Results are shown in the following table:

Grade	Weight of straw run. Pounds	Times through machine.	Weight of tow obtained. Pounds	Yield. Per cent	Dryness. Per cent
Medium tow....	886	2	540	61	83
Fine tow.....	1475	4	768	52	83
Extra fine tow.	2032	8	835	41	83

To afford an idea of how much shive is removed each time through the machine, runs were made at the same plant on kiln dried straw which had been dusted by forking. The yields obtained are based on the weight of the dusted straw, and are shown below. The straw was 92 per cent dry.

Times through machine	Weight of material fed Pounds	Weight of tow obtained Pounds	Yield on basis of material fed Per cent	Yield on basis of original dusted straw Per cent
1	230	170	74	74
2	170	139	82	60.5
3	139	113	81	49
4	113	97	86	42

The more rapid removal of the woody matter in the second series of tests, even though run on dusted straw, was doubtless due to the drier condition of the material. While the quality of the tow improved each time, however, the quantity of bast lost in the shive increased, and a point was soon reached where the losses were becoming prohibitive. The woody matter also persisted even though reduced in quantity, and it is doubtful if it could ever be reduced by use of machines of that nature below the proportion of one part to two of bast fiber.

Combined Mechanical and Chemical Treatments

On account of the difficulty of removing the woody matter from the bast by mechanical towing alone with a reasonable amount of labor or expense, it is obviously necessary to resort to the use of chemicals and steeping or digestion of the two at elevated temperatures either to dissolve the woody matter or to so disintegrate it that it may be readily removed. If the product is to be used in high-grade papers, this action must be brought about without any injury to the bast; and it is with this purpose that investigators have worked on the problem since flax has been grown for linseed oil, but without success.

Milk of Lime (Calcium Hydroxide)

Before the Forest Products Laboratory took up the work it was carried on by the Bureau of Plant Industry under the direction of Mr. J. C. Merrill. He obtained some excellent results, on a laboratory scale, in treating an extra fine tow prepared on a towing machine of his own design with milk of lime, using the methods commonly practiced in fine mills with rags. When his methods were tried in a paper mill, however, the difference in the volumes of material used and the changed ratios of volume to surface and also to volume of water available in washing were such that results were unsatisfactory. The shive is so slightly softened by lime that its entire removal by any of the known paper making operations when so treated seems highly improbable, barring unreasonable expenditures of water or labor. For this reason the lime cooks were not repeated or modified.

A sheaf of unthrashed flax opened up to show the character of the straw

Sodium Hydroxide

No cooks in the present investigations were made with sodium hydroxide alone on account of a number of cooks which were made with this chemical at the Forest Products Laboratory in 1919 on tow prepared on Mr. Merrill's towing machine. The paper obtained gave excellent strength tests, but its color and appearance discouraged further work.

Sodium Hydroxide and Sodium Sulphide [4]

Encouraging results were obtained, however, in the work carried on in 1919, by the use of sodium hydroxide and sodium sulphide, and the strongest paper in which sodium salts were used was thus obtained. Tow from Mr. Merrill's machine was used. When the work was taken up in 1922, cooks were made of commercial tow under similar cooking conditions. The paper obtained, however, did not approach the other in strength, and the difference was ascribed to the poorer quality of the tow and unsatisfactory beater treatment. Equal or better results might have been secured if sufficient pulp had been made for working out the extremely difficult problem of proper

[4] Attention is directed to work along similar lines carried on at the Bureau of Standards in 1922 and 1923 and reported in an article in the Paper Trade Journal, August 2, 1923, page 142 by Kellogg, Shaw, and Bicking entitled, "Seed Flax as a Papermaking Material."

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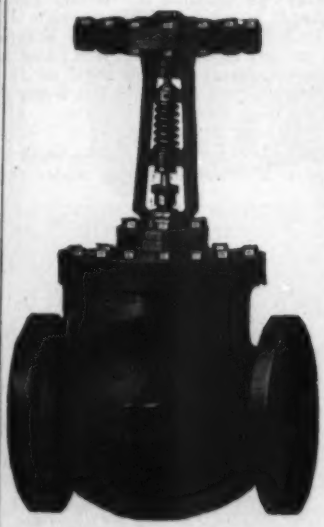

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beating. It was deemed advisable at that time, however, to try out other chemicals.

Type of Tow Used

In the trials of the various chemicals discussed hereafter, commercial tow, sold either as fine or medium, was used. In most cases it was dusted before using and chopped into pieces about two inches long by running through a rag cutter. Various degrees of thoroughness were tried in the dusting and cutting operation; by reference to Table Two it can be observed to what extent any particular cook has been so treated.

Caustic Soda, Sodium Sulphide, and Calcium Hydroxide

In the caustic soda and caustic soda and sodium sulphide cooks the pulps had a tendency to be slimy and to hydrate very easily during beating. In order to overcome this difficulty a series of cooks was run with lime added to the other chemicals, the supposition being that lime would harden the fiber and prevent the tendency to slime. It was found, however, that whenever the fiber was hardened the shive was equally hardened, and that when the cooking conditions were sufficiently drastic to disintegrate the shive the fiber was no better than could be obtained without lime. Nevertheless in cook No. 46, cooked as shown in Table 2, quite satisfactory results were obtained.

Caustic Soda and Sulphur

When a solution of caustic soda is boiled and small amounts of sulphur are added the reaction represented by the following equation takes place:

$$6\ NaOH + 4S = Na_2SO_3 + 2\ Na_2S + 3H_2O.$$

However, when wood is cooked in a solution containing sodium thiosulphate and sodium hydroxide in the proportion of one mole of the former to two moles of the latter, the cooking action of one mole of sodium sulphide is obtained. From these two observations it may be expected that eight moles of caustic soda and four moles of sulphur will produce, when combined, the cooking action of three moles of sodium sulphide. In paper mills accustomed to using rags there would not exist equipment for the recovery of alkali, and the use of sodium sulphide as ordinarily employed in the sulphate process would consequently be out of the question. By using caustic soda and sulphur, however, this difficulty may be overcome, and a series of cooks was accordingly carried through to indicate how the idea would work out. Various proportions were tried and the best results were obtained with 27 pounds of sodium hydroxide and 4 pounds of sulphur to 100 pounds of medium tow under the conditions shown opposite cooks 61 and 62 (Table 2). More of the chemical, higher temperatures, or longer time weakened the bast too much, while less chemical, lower temperatures, or shorter time did not sufficiently reduce the shive. Indications are, however, that by prolonging the time to 18 or 20 hours some improvement might be made by cooking at a lower temperature between 155 and 160° C. The samples of paper which were made in paper machine runs Nos. 2 and 3 from pulps out of cooks 61 and 62 are very satisfactory sheets. Although they are among the strongest made in the experiments, a great deal of work along the line of beating studies must be carried out before a sheet equal to currency paper in toughness can be expected.

Sodium Hydroxide, Sodium Sulphide and Sodium Sulphite

The chemical properties of sodium sulphite would indicate that it might dissolve certain of the ligneous and other noncellulose constituents of the flax with very little action on the bast, and that its reducing nature in much the same manner as sodium sulphide, might tend to prevent a certain amount of oxidation and tendering of the fiber by the elevated temperatures and caustic soda employed. A great many combinations were tried, and in cook 100 (Table 2) a pulp was obtained which yielded the strongest paper made in these experiments. The appearance and color of the sheet, however, was poor, and a few unreduced shives are apparent. Further cooking work with these three chemicals—NaOH, Na_2S, and Na_2SO_3—intensive beating experiments on the resulting pulps are advisable.

Sodium Sulphite

The action of sodium sulphite in conjunction with active alkalies as in the foregoing, suggests the use of sodium sulphite alone. A number of cooks were made accordingly, but the pulps did not lend themselves to treatment in the manufacture of bank note. Some excellent glassine paper was obtained, however. A study of results would discourage the use of sodium sulphite alone. It seems advisable, however, to study the benefits of a digestion with sodium sulphite with subsequent digestions with sodium hydroxide and sodium sulphide.

TABLE 2

Cook No.		46	61 and 62		100	118	119	154	158
Material used, preliminary treatment		Medium tow, cut twice	Medium tow, cut twice		Medium tow, cut twice	Medium tow, cut twice, dusted	Medium tow, cut twice, dusted	Straw, dusted	Straw, dusted
Chemicals used per 100 pounds material:									
NaOH	Pounds	14.1	22		0.9	....	....	17.6	17.6
Na_2S	Pounds	5.5	4		13.3	....	....	4.4	4.4
S	Pounds	....	....		....	....	....	....	....
Na_2SO_3	Pounds	....	....		21.5	17.0	17.0	....	....
CaOH	Pounds	5.3	....		....	....	....	....	....
Volume of cooking liquor	Gallons	60	60		100	....	....	50	50
Maximum temperature	C.	148	166		166	158	158	160	160
Time to maximum temperature	Hours	12	2		2	2.5	2.5	2	2
Time at maximum temperature	Hours	11.5	6		3.25	17.5	17.5	8	8
Yield of unbleached pulp	Per cent	51.4	42		42	59	59	49	39
Bleach required	Per cent	....	....		45	12	....	10	12.5
Paper tests:									
Weight per ream 24x36-500	Pounds	38	54.7	51.0	52	53	50	34	20
Thickness	Inches	.0031	.0045	.0045	.0033	.0033	.0040	.0026	.0020
Strength factor	Points per lb. per ream	.87	.70	.69	.77	.82	.59	.74	.79
Average breaking length	Meters	6,545	6,565	7,295	5,760	2,052	6,920	5,238	6,013
Average folding test	Double folds	369	695	613	2,013	905	42	155	85
Average tearing test	Grams	58	53	55	76	37	43	19	31
Stretch	Per cent	4.1	5.21	5.33	5.7	4.2	2.4	1.7	3.5

Sodium Sulphite and Chlorine

The Cross and Bevan method for the determination of cellulose suggests the use of alternate treatments with sodium sulphite and chlorine. A number of cooks were made and very white pulps of excellent appearance resulted. When beaten for running over the paper machine, however, the fiber disintegrated to a considerable extent. A sample of paper from cook 119 illustrates the character of product. Papers of satisfactory appearance and feel were obtained, but the results of the strength tests were all very unsatisfactory. The complexity of the method, together with the character of the results, would discourage further work. It is believed, however, that the use of chlorine water is worthy of further consideration as one stage in bleaching the pulps obtained by various methods.

Bleaching Tests

A large number of bleaching tests were made by the following methods: Bleaching in one step with calcium hypochlorite; in two steps with the same agent and washing with water after each; the same with preliminary treatments with dilute sulphuric acid; and the preliminary sulphuric acid treatments followed by bleaching with a solution likewise rendered acid. Multi-stage bleaching with intermediate washing showed decided advantages, and the use of sulphuric acid assisted in obtaining a bright white. The very careful use of acid in a preliminary wash and in the first bleaching stage seemed to give good results with the least loss in fiber strength, and for that reason chlorine water instead of calcium hypochlorite is recommended for these steps. The tests made with chlorine water on pulps cooked with sodium sulphite indicated that the shive was very effectively broken down, and the slimy feel characteristic of flax pulps considerably reduced.

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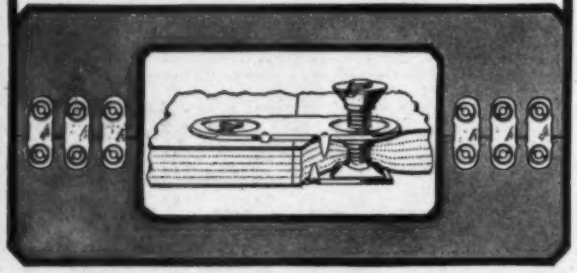

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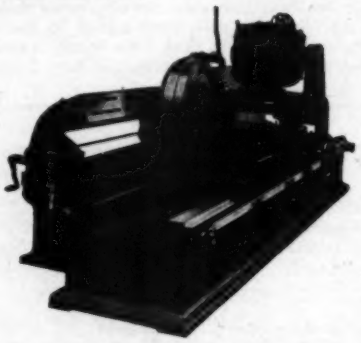

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Cooking Tests on Linen Rags

The work in the foregoing account failed to yield paper of the desired strength and uncertainty existed as to whether the reason therefor was on account of the weakness of the pulps obtained or because of faulty methods or equipment in paper making. A number of cooks and paper making runs were consequently made with linen rag material in order to ascertain results with the laboratory equipment and to compare them with commercial performance. Lime cooks made under the same conditions as are used in the mills were found to produce paper of excellent strength and quality. Sodium hydroxide used in amounts up to 5.78 pounds with 1.06 pounds of sulphur per 100 pounds of rags appeared not to weaken the fiber. Sodium sulphite in the amount of 20 per cent gave a pulp that bleached very easily and a paper of good tensile strength but with less than half the folding resistance of that from the other runs mentioned. These facts indicate that sodium hydroxide and sulphur give by far the best results, and also that when conditions are properly maintained the equipment on hand will produce papers with strength equal to that obtained with commercial machines.

Summary of Investigation on Tow

The investigations on flax tow thus far would indicate that it is very difficult if not impossible so to treat the material with chemicals and elevated temperatures as to disintegrate the woody matter and leave the bast fiber with its original strength unimpaired. Mild treatments may be given, however, sufficient to disintegrate the shive to such degree that it may be washed out by mechanical means, leaving the bast fiber with sufficient strength to make the higher grades of writing paper.

The beating of the fiber is very important; indeed it seems probable that after the best beater treatment is discovered a paper comparable with bank note may be obtained from pulps cooked under some of the conditions already studied.

Although excessive towing will reduce the amount of shive to about forty per cent, the loss of bast is so great that to produce a tow containing less than fifty per cent of shive is considered uneconomical.

Of the digester treatments tried, those with sodium hydroxide, sodium hydroxide and sodium sulphide, sodium hydroxide and sulphur, and sodium hydroxide, sodium sulphide and sodium sulphite seem worthy of further study.

The use of multi-stage bleaching with chlorine water in the first stage and calcium hypochlorite in the last is recommended, and further study will be given the subject.

Products from the Whole Straw and from Towing Waste

As the foregoing discussion would indicate, the main lines of endeavor to date have been the working out of the manufacture of bank note paper from flax tow. Requirements for this paper are the very highest. The quality of the pulps was judged by their yield, freedom from shive, and bleaching properties. The papers obtained were judged for color, formation, freedom from shive, apparent hydration of the sheet, and by the various strength tests enumerated in Table 2. The use of the towed fiber for the manufacture of cheaper papers was not given much consideration for the reason that the cost of tow is too great to consider its use in the manufacture of paper where wood pulp or cotton rags are entirely satisfactory. The cost of such material would be prohibitive in the manufacture of any paper selling for less than twenty-five cents per pound at the mill—unless uses for the towing and washing waste can be found.

In view of the limitations mentioned above, therefore, considerable effort has been devoted to the development of products in which the whole straw is pulped and the entire product used. Studies have also been carried on to ascertain to what extent the towing waste itself could be used in paper manufacture.

Paper from the Whole Straw

Two or three cooks of flax straw by the acid sulphite process were made in 1920 with very unpromising results. It thus appeared that more progress could be made by confining this phase of the work to alkaline or neutral cooking, and the sulphite process was accordingly dropped.

Among the papers or products in which pulps prepared from the whole straw might be used are the following: Counter board; press board; test board; insulating paper (electrical); condenser paper (electrical); tissue; grease-proof paper; hard fiber.

It is obvious that with the time and resources available only a few of these used can be taken up for study. Previous work by the Bureau of Plant Industry on the utilization of flax straw in the first three types of products was attended with considerable success.

In cooking the straw for the manufacture of grease-proof or tissue paper most of the combinations tried with tow were used, and the combination of sodium hydroxide and sodium sulphide seems to be the best. The following conditions gave excellent results:

Chemical used per 100 pounds of straw (oven dry basis)—
NaOH, 17.6 pounds
Na_2S, 4.4 pounds
Volume of cooking liquor per 100 pounds straw, 50 gallons—
Time to pressure, 2 hours
Time at pressure, 8 hours
Temperature at pressure, 160° C.
Yields of pulp obtained, 45 per cent

The pulps obtained were bleached to a light cream color by the use of 10 per cent of standard bleaching powder. They were beaten three hours and ten minutes. The control of the beating was found to be exceedingly important, and further work is contemplated. The strength of the sheets obtained is very encouraging, and this in connection with yields comparable with wood gives hope that flax may find considerable use in paper products.

A sheaf of flax before thrashing

Experiments on Towing Waste [5]

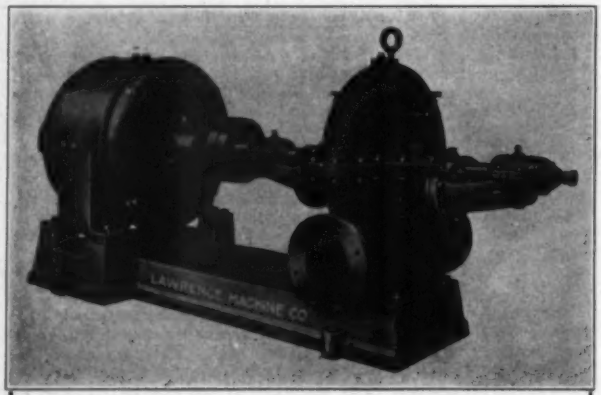
The experiments to determine the pulping properties of the actual towing waste were divided into two groups—the first to ascertain the yield and quality of bleachable pulp suitable for book and similar papers, and the second to ascertain what yields and quality of unbleached pulps might be obtained, suitable for the manufacture of test board.

The results of the first group of tests indicate that satisfactory pulp requiring 15 per cent of bleaching powder can be obtained by the use of 20 per cent of sodium hydroxide and 15 per cent of sodium sulphide, with yields ranging between 25 and 30 per cent. It was evident that under such conditions the production of bleached pulp from towing waste at a profit was impossible, and further work on this phase of the investigation was discontinued.

The second group of tests was made in order to ascertain the feasibility of producing an unbleached pulp from towing waste for the manufacture of test board. In the work on tow indications were that the slimy characteristic of the pulps was due to products coming from the cortex, the cambium layer, and the woody center. By less drastic cooking of the waste a larger and more useful yield of these materials would be obtained, and it was with this object that a number of cooks were made with various combinations and amounts of sodium hydroxide and sodium sulphide. The maximum yields of pulp with a product soft enough to reduce in the beater to a condition suitable for paper making were 62.3 per cent, by use of 10 per cent sodium hydroxide, 4 per cent sodium sulphide, a cooking period of eight hours, and a maximum temperature of 148° C.

Experiments were conducted in which various amounts of

[5] "Pulping of Flat Tow Waste by the Sulphate Process" (reports in Forest Products Laboratory files), by S. T. Fong and C. L. Shao.



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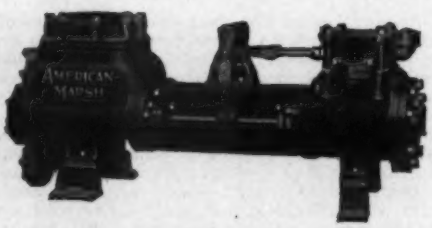

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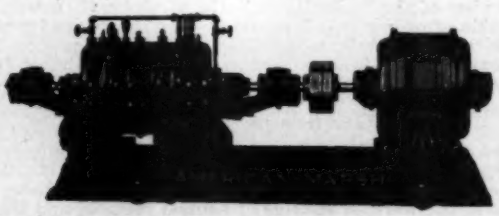

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the pulp were mixed with a half-cooked sulphate pulp from jack pine, and paper was made of the product which gave the following strength tests:

Per cent of pulp from flax waste	Per cent of jack pine pulp	Bursting strength—points per pound per ream
10	90	.155
25	75	.231
50	50	.291
75	25	.313
90	10	.272
100	0	.165

Study of the table will show how the proper blending of the pulp from flax waste with a crude long-fibered stock such as sulphite or sulphate screenings will give a stronger product than can be obtained from either alone.

Another series was run using commercial Kraft pulp from jack pine to the extent of 25 per cent, with 75 per cent of towing waste pulp and the time of beating varied. The paper developed the following strength values:

Time of beating. Hours	Bursting strength. Points per pound per ream
½	.543
1½	.636
2½	.680
3½	.867
4	.758

The results indicate the possibility of utilizing towing waste pulp as a component of such products as test boards, where its cementing properties may be used to advantage with other types of coarse paper stock. In localities where an outlet for the board exists it is probable that the value of the pulp obtained from the tow waste would considerably assist in lowering the cost of manufacturing the better pulps from the tow.

General Summary

In the preparation of flax tow for paper making purposes, it is impracticable to remove by machinery now available more than 75 per cent of the woody matter of the flax stem, on account of the excessive loss of bast after a grade known in the trade as "fine tow" has been obtained.

It seems impossible to prepare pulp of sufficient strength by digestion with chemical solutions for the manufacture of bank note directly from flax straw.

In the manufacture of pulp suitable for bank note it seems necessary to remove as much shive or woody matter as possible by mechanical means and to digest by suitable chemicals under proper conditions the fine tow thus obtained. The pulps resulting must be thoroughly washed to remove the spent lyes and also the ultimate cells of the shive separated by the cooking action. Very careful control of the beating is necessary, even with the best pulps, to produce satisfactory paper. Mixtures of sodium hydroxide with sulphur or sodium sulphide, with or without sodium sulphite, gave the best results. The best application of these reagents seems worthy of further study, together with the question of proper beater treatment, which needs exhaustive investigation.

Pulping tests on the flax straw without preliminary towing indicate that it is possible to obtain yields of pulp of between 40 and 50 per cent, suitable for the manufacture of greaseproof paper, tissue and similar products where the properties peculiar to flax serve to advantage.

Pulping tests on towing waste indicate the feasibility of getting satisfactory yields of pulp suitable for the manufacture of test board in combination with coarse long-fibered stock, such as sulphite or sulphate screenings. The production of tow for the manufacture of bank note and other high-priced papers, together with the utilization of the towing waste for crude products, offers possibilities for the economic utilization of considerable quantities of flax straw now wasted.

The utilization of flax straw by the paper industry can best be accomplished by introducing its use in specialties where it has the greatest inherent advantages and, as the co-operation of farmers is secured, by the gradual extension of its use to other suitable products, until a considerable consumption is attained.

The Melrose Paper Stock Company, among the largest packers of paper mill supplies in New York, is now situated in its new building at 413-415 East 124th street, which is near railroad yards and which has been elaborately equipped with up-to-date machinery for handling, sorting and baling waste paper and rags.

New York City News

"Ted" Watson Makes Change

Theodore C. Watson, familiarly known to his many friends in the local paper trade as "Ted" Watson, is now associated with the paper jobbing concern of Green, Low & Dolge, Inc., of 50 East Eleventh street, New York. Mr. Watson is a fully experienced paper salesman, having been identified with the trade in this city for 15 years. His early training was with Conrow Bros., and afterward he was with the H. P. Andrews Paper Company.

For the past 10 years he has been a member of the sales force of the Seaman Paper Company in the New York office at 200 Fifth avenue and has made a good record in the selling of book and specialty papers. Mr. Watson is a son of the late Edward M. Watson, who was president of the Jersey City Printing Company, and a brother of the late John S. Watson, who was also president of the same printing company.

Union Bag Passes Dividend

The Union Bag & Paper Corporation, of New York, with mills throughout the country, on September 10 passed its quarterly dividend of $1.50 due at that time. The following statement was issued from the offices of the company in the Woolworth Building:

"At the board meeting today it was decided that it would be to the best interest of the company not to declare the current quarterly dividend. To do so would require that such a dividend be paid out of the surplus as current earnings are inadequate. For some time competition has been abnormally severe due in large part to extremely low priced foreign made raw materials. Consumption of the company's products is increasing and new orders are being received proportionately. As demand increases prices should advance and the outlook for business in the future is much more encouraging than at any time this year."

Rider Company Is Absorbed

The Domestic Mills Paper Company, among the largest jobbers in New York and occupying offices and warehouse at 629 West Twenty-seventh street, has purchased the Charles W. Rider Company, of 104 Wooster street, jobbers, who have for a good many years made a specialty of fancy papers for the paper box and other trades. The purchase included the merchandise, machinery, fixtures and good will of the Rider Company. For the present the Rider business will be operated as the Charles W. Rider Company Department of the Domestic Mills Paper Company, with Charles W. Rider in charge of this department, assisted by Robert Miles and Frederick Geddicks.

Louis Salzer Dies

Louis Salzer, second vice president of the Republic Bag and Paper Company, of 200 Fifth avenue, New York, died of heart disease at his home, No. 1 West Eighty-fifth street on September 4. Mr. Salzer was 42 years old. He received his early training with the Continental Bag and Paper Mills Corporation, and had been associated with the Republic Bag and Paper Company for 12 years, and for the last seven years had been second vice president. He spent most of his time in the last two years in Europe with headquarters in Berlin in charge of the foreign buying for his company. A widow and a son survive.

The appraisal discloses that the shrinkage in the estate was due largely to financial difficulties which overtook the Carthage Sulphite Pulp and Paper Company, of which Mr. Outterson was the head. Because of the depression in the paper market just before his death the mill became greatly involved and it was necessary to apply for an equity receivership after his death. He owned 1,641 shares of the company's common stock, appraised as valueless, and 101 shares of preferred stock, appraised as worth $10,100.

The Continental Bag and Paper Mills Corporation for the five months ended June 30, 1924, reports net profits of $200,561 after all interest and charges, equal to 84 cents a share on the $3,750,000 common stock outstanding. Gross operating income was $1,280,191, expenses $747,787, leaving operating profits of $532,404, while interest charges were $303,531, and depreciation $28,312.

The T. E. Boyd Paper Company, of New York, was incorporated under New York State laws at Albany a few days ago to conduct a general jobbing business in paper. The corpora-

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THE GOULDS MANUFACTURING COMPANY
SENECA FALLS, N. Y.

GOULDS

Strain

Crescent Belt Fasteners distribute the strain evenly across the entire Belt and reinforce it at the joint. Curved, they hug the pulley and hold the power. Belt ends, when joined the Crescent way, are held with a vise-like grip. Each rivet grips the lengthwise fibres, leaving no gaping holes to widen or stretch. Crescent Belt Fasteners become part of the belt itself, help it bear the strain of production—deliver the utmost in power. Write for an interesting booklet on Belt joining to Crescent Belt Fastener Co., 247 Park Avenue, N. Y.

CRESCENT
BELT FASTENERS

"You Can Say Good-bye to Rust When You Paint With Bitumastic"

Many plants will be worth less next year if they don't get a new coat before winter comes

IN THE mills that set standards for efficiency and economy, the importance of proper painting is well recognized. Ordinary paint on metal surfaces will not withstand severe chemical fumes and moisture, nor will it adequately protect costly equipment against rust and corrosion. In many leading mills the standard paint is

BITUMASTIC SOLUTION

This rust-preventing paint is made specially to resist extreme temperatures, weather conditions, moisture and chemical fumes. It gives metal surfaces a brilliant black coating, sheds dust and keeps equipment clean and bright for long periods.

Paint up your plant and equipment with BITUMASTIC now and be sure of protection against rust and corrosion—which are always accelerated in cold, wet weather.

Ask for Our Bulletin 164, *"Combating Corrosion."*

WAILES DOVE-HERMISTON CORPORATION
17 Battery Place, New York

322 S. Delaware Ave., Philadelphia
Union Trust Building, Cleveland

tion is capitalized at $20,000, and T. E. Boyd, H. M. Sheridan and H. M. Reineke were the incorporators. William C. Ridgway, of 41 Park Row, is attorney.

News Print Bureau Meetings

The regular fall meetings of the News Print Service Bureau will be held in New York on Tuesday and Wednesday, October 21 and 22. The Tuesday session will be at the Canadian Club and will be of technical character for the discussion of cost accounting and engineering problems. The Wednesday meeting at the Commodore Hotel will be of a general business nature and an interesting program is being arranged. The Bureau is anxious to have all its members attend these meetings.

The Globe Paper Mills Supply Corporation, of New York, was incorporated at Albany on September 25, with a capital of $10,000 to deal in papermaking supplies. Leon Peters, M. Drucker and Albert Yovits were the incorporators.

C. H. Kent, who was for some time general sales manager of the Papermakers' Chemical Company, is now with the Kalbfleisch Corporation, of 200 Fifth avenue, New York.

The Tidewater Paper Mills Sales Corporation, of 33 West Forty-second street, New York, has filed notice of an increase in capital from $200,000 to $300,000.

Northern New York News

October 1, 1924.

Decides Against Carey

Justice Edward N. Smith, of the New York State Supreme Court, has handed down a decision dismissing the complaint of Jeremiah T. Carey and vacating the injunction to restrain the International Brotherhood of Paper Makers from selecting any one else in his place as president of the Brotherhood.

The action was brought by Carey individually as president of the Brotherhood and by Edward Brockway, in behalf of himself and other members, against the International Brotherhood of Paper Makers, Joseph Lauerman, Francis Addy, John Tracey, and James McCune constituting the International board of canvassers, Matthew H. Parker and Henry Grosse, candidates against him, Secretary Matthew J. Burns and Treasurer Dominick McDermott.

The action brought by Mr. Carey was to set aside the decision of the board of canvassers made last October that Matthew H. Parker had been elected president of the Brotherhood. The case was tried in Watertown and both sides submitted briefs which were examined by Justice Smith.

Mr. M. H. Parker, of Richmond, Va., has now assumed his office as president of the International Brotherhood of Paper Makers in the Paper Makers' building in Albany. He will bring his family from Richmond to Albany in the near future.

Mr. Parker was at one time a beater engineer, and in 1911 he was elected fourth vice president of the International Brotherhood. The following year he became an organizer. Automatically he passed to the position of third, second and first vice president and was a candidate for president against J. T. Carey. The courts decided the contested election in favor of Mr. Parker. Frank P. Barry, who has been acting president during the time the matter of the presidency has been in the courts, relinquishes the office.

F. A. Rogers, treasurer of the Northern New York Utilities, Inc., has been named treasurer of the Power Corporation of New York, succeeding R. B. Maltbie. The Power Corporation of New York is one of the Carlisle group of power and associated industries. Carl B. Martin, secretary of the St. Regis Paper Company, remains as assistant treasurer of the Power Corporation.

International Strike Still On

At a meeting of representatives of the International Paper Company and representatives of the locals of the Brotherhood of Paper Makers held in Glens Falls, September 28, it was voted to continue the strike which has been in effect since May, 1921. The conference was held to bring an end to the strike, which is still officially in effect, despite the fact that most of the International mills have been in operation most of the time since then. Frank P. Barry, who has been acting as head of the International Brotherhood of Paper Makers, presided at the meeting, which was attended by representatives of the company, representatives of the union and a representative from the federal Department of Labor. The greater number of the former employees of the International Company have long since found employment elsewhere, although officially continuing in the status of strikers.

There have been various rumors that the International Paper Company would soon resume work at the C. R. mill at Glen Park. There were originally three machines in this mill, but two were dismantled and shipped elsewhere. Local officials of the company disclaim knowledge of any plans to reopen the mill, saying that the only activity about the place is the cleaning up of the property.

New Superintendent in St. Regis

Edwin Leroy McCormick, former superintendent of the St. Lawrence Paper Mills, Ltd., of Three Rivers, P. Q., has been named general superintendent of the St. Regis and Hanna group of mills, both of which are controlled by the Floyd L. Carlisle interests.

Mr. McCormick will be supervising official over all of the mills of the St. Regis and Hanna groups on the Black and Racquette rivers. He will reside at Deferist, but will spend most of his time traveling between the mills of the Carlisle group, which are the third largest newsprint producers in the world. W. N. Carls, former superintendent of the St. Regis mill at Deferiet, goes to Three Rivers to take the place vacated by Mr. McCormick.

Applications for the creation of a Racquette River regulating district have been withdrawn, ending a two-year fight over the project, according to an announcement from the New York State Water Control Commission. Six hearings were held on the proposition. The International Paper Company was the principal advocate of the creation of the regulating district. There was a determined opposition from communities near the headwaters of the Racquette, principally from Tupper Lake, where it was charged that the creation of the reservoir would seriously damage property.

Louis Martin, superintendent of the Deferiet plant of the St. Regis Paper Company, dropped dead while on his way home from the mill. Mr. Martin was born in Canton and had spent his entire life in northern New York. He had been associated with the St. Regis company several years. He served as night foreman and later became assistant superintendent. Upon the death of Superintendent Robert Wark last spring he became superintendent.

Jeremiah T. Carey, former president of the International Brotherhood of Paper Makers, is confined to his home in Albany, suffering from serious injuries which he received while in an automobile accident. Five toes are broken, two being nearly severed. A car struck Mr. Carey's car at right angles. Carey's foot was caught in the door and badly crushed. He was also cut about the face and hands by flying glass.

The pulp terminal at Ogdensburg, containing 40,000 cords of pulp wood, was threatened with destruction recently. Fire broke out in the conveyor and a good sized area of the pulp wood burned before the fire was under control.

J. Victor Baron, vice president and general manager of the Sherman Paper Company, has been re-appointed a member of the Black River Regulating Board by Governor Smith.

Archibald P. Ramage, treasurer of the Missiquoi Pulp and Paper Company, Sheldon Springs, Vt., sailed from New York a few days ago on a business trip to England.

Federal Foresters to Examine Forest Plantings in Lake States

As a needful step at this time in the program of the Lake States Forest Experiment Station for the study of tree planting, Director Raphael Zon states that the station will start a careful survey of all the planting work that has been done in past years in Minnesota, Wisconsin and Michigan. It is felt that, while the task of restoring to usefulness the 20,000,000 acres of denuded forest land in these three States is yet in its infancy, enough has already been done by various Federal, State and private agencies to form a basis of very profitable study. The survey as planned will help to determine the extent to which forest planting is advisable and how it can profitably be increased. The plantations to be examined include those of the United States Forest Service on the Michigan and Minnesota national forests, and similar plantations by the Michigan Department of Conservation, the Michigan Agricultural College, the Forest School of the University of Michigan, the Minnesota State Forest Service, the University of Minnesota and the Wisconsin Conservation Commission. Examination of these areas will, it is expected, show the rate of growth that can be expected, the best species to plant, the effect of different methods of planting, the best size stock to use, and the damage done by rodents and other pests.

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INCREASE the standard of your product and reduce the cost of production.

For every paper manufacturer, we have a bureau of experts who have thoroughly investigated the paper industry, and are in a position to give you information concerning the increase of efficiency in your manufacturing process by the use of our starches—

FOX HEAD NIAGARA SPECIAL PAPER

are the starches especially designed for Top-sizing, Beater-sizing and Pasting.

Corn Products Refining Company
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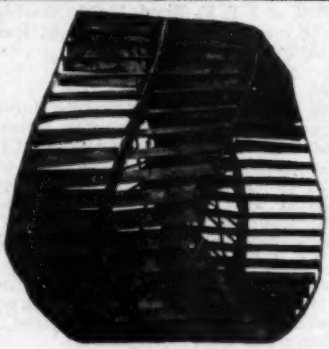
Starch



This blast wheel is an extraordinary demonstration for the strength of Plexiform construction and bears out the claim of Bayley engineers—proven many times by less severe tests— that Plexiform construction has the maximum of structural strength, though comparatively light in weight.

STRENGTH

This wheel was crushed under tons of debris when a four-story building collapsed upon it.

Not a rivet was broken, not a joint loosened, nor a fracture in any part.

Strength of materials is sometimes proven by unusual tests, by strains out of all proportion to those experienced in actual use.

21

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Established 1836

SOUTHWARK
HYDRAULIC PRESSES
for
Pulp, Sulphite and Baling

THE presses illustrated are the Southwark Standard Type, designed for use with Southwark Trucks. These presses permit the pulp to be pressed directly on the truck, this effects a great saving in time and labor.

We have many other designs in hydraulic presses, including the self-contained type, in which the pump and motor is an integral part of the press, no other hydraulic apparatus required.

Special presses or machines designed to suit your requirements.

A complete line of pumps, accumulators, valves, fittings, etc., is carried in stock.

SOUTHWARK
Foundry and Machine Company
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Two 600 Ton Southwark Pulp Presses. Part of a Battery of Six Southwark Machines Installed at the Backus-Brooks Co., Kenora, Ontario

Canadian Section

October 1, 1924.

Excellent Showings of Large Newsprint Producers

That the large Canadian newsprint industry, which is growing apace and will soon be the most important in the world, is in a very healthy condition is shown conclusively by the splendid annual reports of the Laurentide Company, Limited, Spanish River Pulp and Paper Mills, Limited, and St. Lawrence Paper Mills, Limited, which have recently been made public.

Laurentide

The Laurentide Company has always been regarded as one of the most conservatively managed and thorough-going institutions of its kind in the Dominion, and its record is watched with a great deal of interest.

The total profits for the year ended June 30, 1924, were $3,551,590, as compared with $3,167,998 for the preceding year. After allowing for depreciation nearly double the amount allotted to that account last year, there remained net profits equivalent to 7.2 percent on the capital stock, as compared with 6.9 per cent in 1923 and 6.2 per cent in 1922.

President George Chahoon, Jr., in his remarks to the shareholders at the annual meeting, revealed the fact, hitherto not generally known, that Laurentide had added considerably to its timber reserves during the last year, which fact was largely responsible for the size of the company's bank loan. This will be steadily reduced as the timber supply is used up.

Commenting on the inventories, he stated that owing to the fires of last year it had been found necessary to cut over much of the affected areas to prevent deterioration of the wood, this being responsible for the relatively large figure at which inventories stood at the close of the year.

The company's mill at Grand Mére has been operating on a curtailed basis since January on account of a slight overproduction in the industry, which condition will continue until the growth of demand absorbs the new production which is being put on the market.

The retiring board of directors was re-elected for another term.

Spanish River Pulp and Paper Mills

For the year ended June 30th, Spanish River shows gross profits of $5,038,029, or slightly over a million dollars more than the previous year, and net profits of $3,119,660, equivalent to 26.6 per cent on the common stock, as compared with 16.7 per cent in 1922-23 and 9.1 per cent in 1921-22. A working capital increased by about $1,500,000 to over $9,000,000, a $1,000,000 bank loan completely eliminated, funded debt and notes outstanding reduced over $500,000, and a general strengthening of the company's position as to reserves, combine to make this one of the finest showing of any Canadian industrial company for the past year.

The company's position as regards timber limits has been improved in a way that is more extensive than has generally been appreciated. Measures of conservation have been employed which ensure new growths of pulpwood. The freehold land acreage owned by the company also possesses great value.

President George H. Mead stated that many improvements have been made during the year to the company's plants at Sault Ste. Marie, Sturgeon Falls, and Espanola.

St. Lawrence Paper

The initial financial exhibit by St. Lawrence Paper Mills, Limited, showing the results of operations for the year ended June 30, 1924, makes a very creditable showing, both as to earning power and financial position. Net earnings for the year, after deducting all charges and allowing for preferred dividend requirements, were equivalent to slightly over $2.90 per share on the 50,000 shares of no par value common stock. The strong liquid position of the company is a feature of the report, with net working capital, amounting to $707,684, cash alone being in excess of all current liabilities. Bank indebtedness has been entirely eliminated.

In the course of his remarks to shareholders, President N. A. Timmins stated that the inventory of wood at the mill was written down sufficiently to cover any possible loss which might be incurred while the wood remained in the pile. All necessary repairs were made during the year and were charged to the cost of operation. In view of the strong liquid position and the earning power shown by the company, the directors deemed it advisable to declare 4 per cent of the back dividends due on the original issue of 10,000 preferred shares. As all the preferred stock ranks pari passu it was necessary to do this to put all the preferred shares equal on a dividend basis.

In speaking of the outlook for the future, he considered that even should the price of newsprint be reduced a few more dollars per ton the price would still be enough for the company to carry on and make a good showing. Touching on the question of an embargo on pulp wood, he said that he felt it would be a good and desirable step from the point of view of the country at large, and suggested that there should be imposed a tax of a few dollars at the start, which should be increased each year, so that eventually a situation would be created which would be to the advantage of those who are developing the industry in this country. In the meantime such a graded scale would give the mills in the United States an opportunity to adapt themselves to the changing conditions.

The retiring board of directors was re-elected for another term.

Riordon Properties Revert to Bondholders

As had been generally expected, the Riordon Company, Limited, properties, which were placed at auction on September 8th, were bid in by the bondholders. The two groups of bondholders, 8 per cent and 6 per cent, bid in their respective properties—properties which, while the Riordon Company was still a going concern in July of 1921, were placed in a balance sheet at a total valuation of approximately $70,000,000—for a total of $7,302,500, subject to liens against them amounting to over $1,500,000.

This sale, at which the representatives of the two groups of bondholders were the only bidders, does not settle the question as to what is finally to become of the Riordon properties. The bondholders are bankers rather than pulp manufacturers, and what they will do now that they have attained possession of their properties remains to be seen.

The rumor of the possibility of their sales to International Paper Company persists despite denials. Incidentally, President Graustein of International was present at the sale, but as legal representative of the 8 per cent Riordon bondholders, not as president of the International Paper Company. If it should so happen that International Paper should purchase these properties, it will be no new idea on the part of the United States company. In fact, it would be the consummation of an idea of Philip T. Dodge, now chairman of the International board, nearly fifteen years ago.

As far back as 1911, International held an option on the Gatineau property and had a special survey made by R. O. Sweezey. The option, it is understood, called for a substantially smaller sum than the bondholders bid the properties in at, and also smaller than the purchase price paid for them by the Riordon interests.

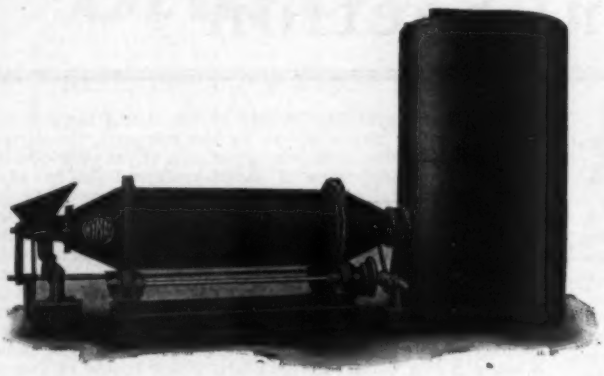
Prior to the opening of the sale a petition had been presented in the Practice Court at Montreal before Justice Duclos, by E. E. C. Grant, asking that the sale be stopped. Mr. Grant claimed that he had granted some lands to the Kipawa company in return for which he later took notes of the Riordon Company which had not been paid. He claimed that these lands were still his property, but his petition was not upheld by the court.

It is understood that there will be no interruption in the conduct of the business, either in manufacturing or selling.

Expect Price Brothers' Financing

In connection with the expansion of newsprint manufacture in Canada, a great deal of interest has been aroused in connection with the big expansion program of Price Bros. & Co., Ltd., and an announcement is soon expected with respect to how the new developments are to be financed.

The impression is that nearly $10,000,000 of new money will be required, and it is expected that this will be met in part by a new issue of some class of security to the amount of between six and eight million before long. The last financing done by the company was in February of last year, when a



SULPHUR BURNERS

THE efficiency of the ROTARY SULPHUR BURNER is so well known as to need no comment here. We have built it in Canada for many years in sizes 36″ x 8′ 0″ to 48″ x 20′ 0″. Self Feeds for dry sulphur. Melting Tanks with piping systems and steam Plug cocks, Combustion Chambers and direct connected Electric Drives are also part of our product.

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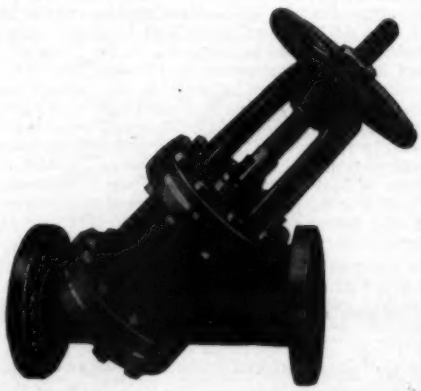
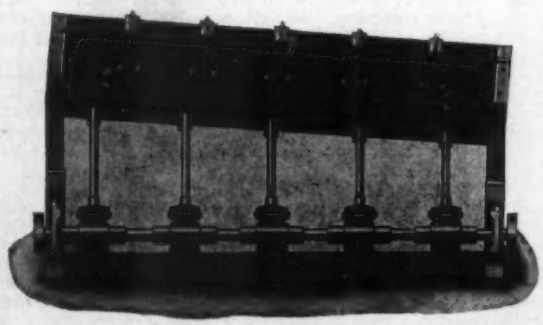
WE have a most complete EQUIPMENT OF PATTERNS covering all types of Valves, Fittings, Pipe and Specials.

We have provided some of the largest Sulphite producers in Canada with complete equipment.

Analysis to customer's specifications.





FLAT SCREENS

ONE Canadian Sulphite Mill uses 138 of our HYMAC INCLINED SCREENS (Patented). Many others are users in less degree of Flat or Inclined. We use a special Cam that is of chilled cast iron, ground to size. Its shape imparts a quick upward blast which frees the plate of foreign matter and a slow downward motion which ensures the maximum production. There are many other features that warrant investigation.

THE HYDRAULIC MACHINERY CO., LIMITED

MONTREAL, QUE.

$10,000,000 issue of 6 per cent first mortgage bonds was sold by Harris, Forbes & Co.

The last balance sheet issued showed capital stock at $42,000,000, and bonds outstanding at $10,000,000. Some people incline to the idea that any new financing at this time will come in the form of preferred stock, a class of security which the company has never issued so far.

St. Maurice Paper Financing

St. Maurice Paper Company is expected to bring out shortly the bond issue forecasted by the president at the last annual meeting. This issue will, it is understood, be around $3,000,000 at 6 per cent rate, maturing in 1944. The proceeds of the sale will care for the installation of the two new newsprint machines which the company has been building this year. The company has no other issue of bonds and no preferred stock. The offering will probably be made in the United States, where the company is controlled.

Chicoutimi Pulp Activities

As evidence of the intentions of the Chicoutimi Pulp interests to resume operations permanently, tenders for the cutting of 15,000,000 feet of pulpwood have been sought by those looking after the interests of that company and some of its subsidiaries.

It was rumored that J. A. E. Dubuc and Sir Frederick Becker were still the predominating factors in the reorganization, and financing was said to have been successfully carried out through them in England. But these reports were promptly denied officially by the bondholders' committee, in whose hands are the affairs of the company.

Expansion at Fort Frances

It is understood that E. W. Backus, of the Fort Frances Pulp and Paper Company, has agreed to a proposal for paper mill expansion in Fort Frances, Ont. The new proposition in brief is that contained in a previous agreement, whereby Mr. Backus is to build a paper mill in addition to the present one which has a capacity of 150 tons a day, the new mill to have a capacity of 100 tons a day; and Mr. Backus is to proceed with the development of the Seine River power scheme for the purpose of developing this power to its capacity.

Fort Frances is to agree to a fixing of the company's assessment. First, the taxes payable by the company, not only for its present industry but for all future and allied industries, to be a lump sum each year. The town is asking for $40,000, while Mr. Backus holds out for $30,000. The town would do all in its power to assist in the passing of the necessary legislation, and in case of failure of the Ontario legislature to ratify the arrangement, then the town would agree to fix the assessment for general rates at $100,000 for a period of ten years, to begin when the company commences construction.

The company would agree to complete the mill within one year, barring strikes and other occurrences beyond its control. The town is to assist the company in securing an adequate supply of pulpwood in Ontario, it being understood that this supply shall include all the pulpwood tributary to the Rainy River watershed.

It is believed work on the new paper mill will be commenced within three months.

The Ontario Government has been selling several timber berths lately, and the highest price in the history of such transactions is being realized for white and red pine, spruce, balsam, poplar and other woods. During the last two or three months timber sales have been made which will ultimately bring to the province nearly $4,000,000 in revenue.

Utilizing Fire-Killed Wood

The enormous amount of fire-killed timber in Canada and what use can be made of it is receiving much attention from those interested in conservation and the elimination of waste. Research shows that the fire-killed wood can be used for paper making.

Considerable investigation has been carried out by the Forest Products Laboratories of Canada, at Montreal, the object being to determine the effect of fire-killing and superficial charring on the pulping qualities of spruce and balsam. This valuable work has clearly shown that this otherwise waste product can be successfully used for the manufacture of sulphite pulp.

Such a result will mean much to Canada, in that it widens the resources of her forest and will enable them longer to withstand the enormous drain made upon them by the ever-growing newsprint industry.

War Memorial Unveiled at Sault Ste. Marie

Before a crowd estimated at 7,000 to 8,000 people, Governor General Lord Byng of Vimy unveiled the War Memorial erected by the citizens of Sault Ste. Marie. His Excellency was making an unofficial visit and was accompanied by Lady Byng and other members of the vice-regal party.

Colonel C. H. L. Jones, manager of the Spanish River Pulp and Paper Mills, who raised and took overseas the battalion from the Soo, made a brief address, and this was followed by the rendering of the special verse written for this memorial by Rudyard Kipling.

Big Doings Rumored for Northern Ontario

Negotiations have been in progress for several months, the consummation of which would automatically settle the difficulties of the present power situation in Northern Ontario, where the Hollinger Gold Mines have been experiencing considerable difficulty in procuring the power required for their large expansion program. It is now understood that these negotiations are practically completed, and that little remains to be done except the formal signing of the documents.

The Insull interests of Chicago have been angling for the control of important hydro-electric power development plants in the north country. E. R. Wood, president of the Dominion Securities, which has handled Northern Canada Power Company bond financing, has been concerned in the negotiations, which will affect Hollinger, Northern Canada Power, Mattagami Pulp and Paper, and Abitibi Power and Paper. The project is one of the most gigantic in the history of Northern Ontario, affecting mining, pulp and paper and power enterprises. It will clear away the difficulties that have been facing the various parties to the projected consolidation of power interests.

An incidental development of large importance is likely to be the establishmentment of a pulp and paper mill on the Mattagami River. It is reported that plans are being made to have this the largest paper mill in the world, with a daily capacity of 1,000 tons. Smoky Falls on the Mattagami River, capable of developing 200,000 horsepower and the largest and best power site in Ontario north of the St. Lawrence, would be utilized. The mill site would probably be Smooth Rock Falls, where the Mattagami Pulp and Paper Company, a subsidiary of the Kimberly-Clark Company, Neenah, Wisconsin, already has a 175 ton sulphite mill in operation. Such a mill would require about 100,000 horsepower.

To feed such a gigantic mill, there remain untouched some of the best pulpwood limits in the north, such as the Groundhog, Nagagami and Algoma Eastern limits. Morrow and Beatty have started surveying a railway line from the end of steel on the Temiskaming and Northern Ontario westward to Smoky Falls.

Laurentide's wood pile is growing apace. One of the biggest drives in recent years is in the river and a large amount of wood has been brought in on the railway. There will be wood brought in right down to the middle of October, and there is little doubt that the pile, when it is finally covered with its winter blanket of snow, will equal in size the big pile of 1921, the biggest in the history of the company. The pile at present contains about 100,000 cords, while in 1921 the pile contained 115,000 cords.

Punish Careless Woodsmen

An excellent method of punishing infractions of the forest fire laws by employees of the lumber and pulp and paper companies working in the Quebec woods has been adopted by the Eastern Division of the Southern St. Lawrence Forest Protective Association. This body of limit holders has decided to place on a special list the names of any persons working in the bush in the employ of any member of the association who has set or caused to be set a forest fire through negligence or carelessness. This list of careless employees will be sent to all members of the association, and no further employment will be given to the guilty ones.

The first offence automatically means a suspension from employment of from one to five years, and the second offence suspension for from two to ten years.

The co-operation of the lumbermen of New Brunswick has been requested so as to make the plan apply to both provinces.

D. Cameron & Co., Ltd., was recently granted Ontario corporation to acquire the interests known as Cameron & Co., and to conduct the business of manufacturing and dealing in products of wood, paper and metal. The authorized capital of the company is $40,000.

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INDUCED AND FORCED DRAFT FANS
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ECONOMIZERS
HEAD OFFICE—TORONTO
VANCOUVER, MONTREAL, WINNIPEG

Slight Possibilities of Overseas Markets for Canadian Goods

On his return home after spending several months in England in connection with the pulp and paper exhibit in the Canadian Pavilion at the Wembley Exhibition, Edward Beck, Secretary of the Canadian Pulp and Paper Association, declared that small wages, low production costs and general post-war condition in Europe make it impossible for the Canadian to compete in foreign markets at present, and any manufacturing expansion must be on home territory under the protection of an adequate tariff.

Speaking of the value to Canada of the British Empire Exhibition, Mr. Beck stated that those who have made displays report numerous enquiries from all parts of the Empire, and from other countries as well. This is particularly true of the pulp and paper industry, whose joint display through the medium of the Canadian Pulp and Paper Association occupies a prominent and extensive place in the Exhibition.

But the fact remains, and the efforts made at Wembley to expand Canada's external trade only serve to emphasize it, that Canada can only sell her manufactured products abroad when her manufacturers are able to compete with other countries. This, in most instances, they are unable to do at present, chiefly owing to the high production costs in this country.

Future of Whalen Pulp Uncertain

While an effort is being made by the bondholders' protective committee to bring about early reorganization of the Whalen Pulp and Paper Mills, Limited, of Port Alice, B. C., settlement is not yet in view. The mills are understood to be in satisfactory operation at the present time, but a great deal of the future success of the organization depends on the ability of the company to pay its way. Every effort is being made to re-develop the Oriental market, which was badly upset by the effect of the Japanese earthquake, and also the more immediate Pacific Coast market. Some shipments have been made to the Eastern markets via the Panama canal, but the transportation costs and the time involved are detrimental to the building up of a very large traffic with this market.

Much interest has been taken in the effort being made by Hon. T. W. McGarry, K. C., to organize the debenture holders, but up to the present time it is not known how well the deposit of the debentures with the committee have gone forward. A number of holders report that they have not yet received deposit requests from the committee.

New Ship for England-Newfoundland Service

The Anglo-Newfoundland Development Company, with mills at Grand Falls, Newfoundland, has had a cargo steamer built for it by Vickers, Limited, England, which is specially designed for the carriage of paper in rolls, the depths of the holds and between decks being arranged to give a minimum waste space. The boat has been made the "Geraldine Mary," after Mrs. Harmsworth, mother of the late Lord Northcliffe and Lord Rothermere.

The boat is intended specially to bring paper from the Daily Mail and Daily Mirror paper mills in Newfoundland. It can burn either coal or fuel oil.

Power for Kenogami

So as to allow work on the Kenogami dam in the Chicoutimi district, which is expected to be completed late this fall, to be pushed through rapidly, a petition was presented to the Public Service Commission by the Running Streams Commission asking for permission to install a transmission line from the city of Jonquières to the dam.

This line will be some twenty miles in length and will carry 13,200 volts. The municipality of Jonquières has its own electrical development, which will be the source of the supply of that electrical power. According to preliminary reports the cost of the installation of the transmission wires will be about $35,000.

The dam will regulate the flow of water in the river, thus enabling the mills in the vicinity to run throughout the year, whereas up till now they have been obliged to shut down several months a year for lack of water.

Brown Corporation to Expand

The Brown Corporation, which operates a lumber mill and a 220-ton sulphate mill at La Tuque, Quebec, is reported to be planning considerable extensions, which will run up into millions of dollars. It is thought that in addition to the present sulphate mill a plant may be erected for the production of sulphite pulp.

Quite probably steps will be taken to harness some of the valuable power sites controlled by the company on the St. Maurice River. The company has developed 4,400 horsepower at La Tuque, but controls sites capable of producing 140,000 horsepower. Much of this power would be required for the new pulp mill and it is just possible that power might be developed for sale to other industries.

At La Tuque turpentine is now being manufactured, and attention is being directed to the possibility of adding to the chemicals manufactured there.

Creditable Safety Record

The accidents for August at the mill of the Abitibi Power and Paper Company, Iroquois Falls, Ont., were the lowest in number and loss of time for any month during the present year. Only 11 accidents occurred, showing 532 hours lost time.

With every foreman and man applying Safety First to his work, the company hope that September will show an even better record than August.

Cost of Producing Newsprint in Canada

The Financial Post, of Toronto, in an analysis of the newsprint production costs of various Canadian mills, points out that there is a big variation, and gives the following interesting comparisons of leading companies:

Abitibi

To pay bond interest and present dividend of $4, Abitibi must earn per ton ..... $ 12
To pay $6, must earn per ton ..... $ 15
Last statement showed, after depreciation ..... $ 22

This is the highest net profit shown by any company and stamps Abitibi as a low-cost producer.

Belgo

To pay interest, preferred dividend and start common off at 4 percent, Belgo must earn per ton ..... $ 6
To pay 6 percent, must earn ..... $ 10
To pay 8 percent, must earn ..... $ 13
Present earnings, probably about ..... $ 20

This is figured on actual output, not on capacity.

Laurentide

To maintain present dividend takes per ton ..... $ 12
1924 statement showed a little over ..... $ 13

Allowance has been made for $400,000 of power revenue.

Price Brothers

To pay bond interest and present dividend, Price Bros. must earn per ton ..... $ 9.50
To double dividend, must earn ..... $ 15.00
Last statement showed, per ton ..... $ 15.00

This assumes that lumber business only broke even. Larger output and larger bond issue will alter figures.

Spanish River

To pay present dividend bond interest and present dividends of 7 percent on common and preferred as well as proportion of dividends to bond holders takes, per ton ..... $ 10.00
To pay 10 percent on both ..... $ 13.50
Spanish earned in 1924, after depreciation, per ton about ..... $ 16.00

Power Shortage at Fort William

A delegation from Fort William, Ont., went to Toronto a short time ago for the purpose of securing assurances from the Provincial Government and the Hydro-Electric Power Commission that Fort William can get sufficient hydro power adequately to supplement Kaministiquia power, of which there is expected to be a shortage this fall.

Frank Spence, M. P. P., stated that this expected shortage would be partly due to low level of water in Dog Lake and partly to Fort William's increasing industrial demands. Mr. Spence declared that, assured of ample power suplies, Fort William was due for big industrial expansion. Particularly did he know of a couple of pulp mills which would locate, once the city had all its power difficulties ironed out.

End Blown Out of Mill

A boiler explosion in the old section of the Lincoln Paper Mill at Merritton, Ont., during the night of September 25th, blew the end out of a stone building, the boiler being carried 300 yards.

Had the explosion occured in the daytime, there would have unquestionably been a death list. The only man near the scene of the explosion was thrown into a vat of warm water, but was unhurt. The damage is estimated at $15,000.

Western Quebec Paper Starts Operations

The Western Quebec Paper Mills, which have been in course of construction for the last year, went into production about the middle of last month, the first paper being put over the machine on the 17th.

This company was organized something over a year ago by a group of well known Montrealers. The president of the company is Mr. R. W. Barclay, vice-president of the Ottawa-Montreal Power Co.; Wm. Currie, of the Dominion Paper Co., vice-president; C. de Wolf Reid, managing director; the other directors being H. M. Banks, and J. H. Robertson, a well known electrical engineer.

The company has been organized to manufacture higher classes of light weight specialities, most of which are still being imported. Among the lines that they will manufacture are tissues, manifold papers, onion skins papers, and other specialties. The policy of the company will be to do business through the wholesale distributing houses and converters of the lines they will make. It is understod that the sale of the entire output of the mill has been arranged for, and there seems to be no doubt about the enterprises being a most successful one.

The mills are located at St. Andrews East, Que., about two miles from the mouth of the North River, and on the lines of the Canadian National Railways. The head office is in the Keefer Building, Montreal.

It is interesting to note that the mill is situated almost on the exact site of the first paper mill erected and successfully operated in Canada.

New Equipment for Iroquois Falls

Another four thousand five hundred K. V. A. generator has been ordered for the Twin Falls power plant of the Abitibi Power and Paper Company.

A 2,000 pound steam hammer is on order for the blacksmith shop and installation is expected in the course of a few weeks; also, a heavier planer for the machine shop.

Work has been progressing satisfactorily on the new stokers, and they are expected to be in operation early in October.

Belgo Doing Well

The matter of production costs is a factor that is becoming more and more important in the manufacture of newsprint. Belgo is reported to be happily situated in this respect, and in the month of August, operating at about 85 percent of capacity, showed something over $139,000 on the common stock.

Rumors to the effect that the company had lost a large quantity of logs are officially denied.

Norman Dam Centre of Considerable Interest

Some time ago E. W. Backus, who owns the famous Norman dam through which the level of waters in the Lake of the Woods is controlled, and engineers met Hon. Charles Stewart, minister of the interior at Ottawa and engineers of the Department, in the hope of arriving at an agreement as to apportioning the cost of the necessary repairs to the dam. Last year engineers of the department reported that the

Fire Brick and Fire Clay

The making of pulp and paper is not accomplished under conditions common to all. They vary greatly. The fire brick that would suit one condition or equipment might fail in another. There is as great a difference in fire brick clays and processing as there is in the selection and processing of raw material in the paper industry.

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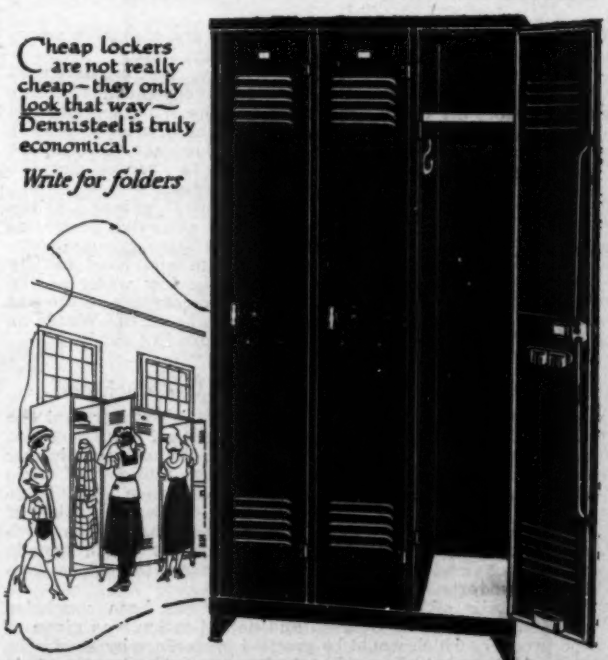

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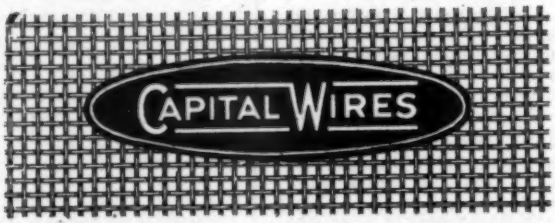
ALL MESHES *PROMPT SERVICE*



CAPITAL WIRE CLOTH & MANUFACTURING CO., LTD.
OTTAWA, CANADA

condition of the dam was unsatisfactory and that high water might result in sweeping a part of it away.

Since then, a delegation representing the provinces of Ontario and Manitoba, the Ontario Hydro-Electric Power Commission, the City of Winnipeg and the Winnipeg Electric Railway, conferred with the minister of the interior to protest against any arrangement whereby the Dominion Government might grant E. W. Bakus the right to reconstruct the Norman Dam and use it for power purposes.

The Manitoba Government, the City of Winnipeg and the Winnipeg Electric Railway, which have extensive power interests, fear that Mr. Backus will make some arrangements whereby they will be dependent on him and have to pay exorbitant sums for storage water. The low water at the Winnipeg River watershed and the rapid increase in the use of power in that area have made the Lake of the Woods as a storage reservoir one of the most valuable in Canada.

Trade Treaty with Australia Is Concluded

It was announced recently by the Prime Minister that the negotiations with Australia, which have been carried on for several months by the Hon. James A. Robb, acting minister of finance, and the Hon. Thomas A. Low, minister of trade and commerce, have resulted in the conclusion of a trade agreement between the two Dominions. The agreement is of a reciprocal nature, granting the Dominion of Canada preference in many lines of export, in return for which Canada agrees to extend equally favorable treatment to various Australian products.

No details of the agreement which has been concluded were made public at Ottawa, and no indication was given of the products which would be granted preference by Australia, nor of those which would receive favorable treatment in Canada. "It is anticipated that the agreement will do much to encourage trade along reciprocal lines, and to cement further the cordial relations existing between these two parts of the Empire", states the official announcement.

It has been expected right along that Canadian newsprint would be one of the articles which would benefit the most by such an agreement; and there is little doubt that if Canadian producers receive the same treatment as English newsprint manufacturers, namely exemption from the $15 a ton duty, it will go a long way towards absorbing the present surplus in Canadian production which is acting towards lowering prices.

Port Alfred Production at Peak

Production at the Port Alfred sulphite mill for the first six months of 1924 is higher than for any other corresponding period, registering an increase of 11 percent over the corresponding period in 1922, the previous record year. During August production totalled 4,077 tons, representing a daily average of 156 tons, or at the rate of 50,000 tons annually.

St. Francis River on the Rampage

The St. Francis River in Quebec Province went on a rampage recently, owing to heavy fall rains. Bridges were carried away, lumber was floated down stream, and a number of industrial establishments were flooded. The water rose to a higher point than at any time within the last thirty years.

The loss of pulpwood is also quite heavy. The Brompton Pulp and Paper Company's side boom at East Angus was carried away by the high water, while quite a lot of pulpwood was also lost at Bromptonville.

Provincial and Mattagami Mills Operating Satisfactorily

Word from the Provincial Paper Company's mill at Port Arthur states that the two new pulp grinders, which were recently installed, are operating satisfactorily. The mill now has a total capacity of fine quality groundwood pulp of from 30 to 35 tons a day. The company are also manufacturing about 60 tons a day of sulphite, mostly bleached, and about 35 tons of paper.

S. R. Armstrong, of the Mattagami Pulp and Paper Company, Limited, Toronto, recently stated that the company's mill shipped approximately 6,000 tons of unbleached sulphite during the month of August, 95 per cent of which went to the United States. The mill is turning out on an average of from 170 to 180 tons of unbleached sulphite per day.

E. A. Bradshaw, of Bradshaws, Limited, Toronto, waxed paper manufacturers, has returned home from a business and pleasure trip to England.

Prosperous Industry Makes a Thriving Town

The newest pulp and paper town in Ontario is Kapuskasing, where the Spruce Falls Company, a subsidiary of the Kimberly-Clark Company, Neenah, Wis., operates a busy pulp mill. The rated capacity of the plant is 100 tons of sulphite a day; but it is running well above that mark, and a new goal of one hundred and twenty tons has been set.

Great interest is being taken by the employees in safety work and the slogan is "Kapuskasing, the Home of the Safest Pulp Mill Crew in Canada." Many improvements have been made in the townsite during the last few months. Sidewalks and roads have been built, sewers and water mains extended, and one hundred homes erected, fully equipped with all modern conveniences. New stores are being erected and a fine station has been completed.

Kapuskasing, which has a well arranged Community Club House for the employees of the company, is at present the fastest growing place in northern Ontario.

Another Newsprint Mill for Newfoundland

The newsprint industry seems to be in a fairway to relieve unemployment in Newfoundland, according to the speech of the Governor General, Sir William Allardyce, at the proroguing of the legislature.

Among the bills passed during the session was one providing for the erection of a third paper mill in the Gander Valley, in the northeast portion of the island, with a daily capacity of 300 tons of newsprint.

Walmsley Plant Busy

The big plant of Charles Walmsley Company (Canada), Limited, at Longueuil, Quebec, manufacturers of pulp and paper mill industry, is very busy according to J. W. McCammon, the sales manager of the company. They have just contracted to supply Price Brothers & Company with two 234-inch newsprint machine, which are to be installed during 1925, at the projected mill at St. Joseph d'Alma, and will commence producing paper early in 1926.

In addition, the Walmsley Company have contracted to supply the E. B. Eddy Company, of Hull, Quebec, with a 234-inch fourdrinier machine, complete with Harland sectional electric drive. At the present time four of the eighteen Warren magazine grinders which are to be installed in the Newfoundland Power and Paper Company's mill at Corner Brook, Newfoundland, are being built at the Longueuil plant.

Thunder Bay Extensions Completed

Construction of the new addition to Thunder Bay Pulp and Paper Company's mill has been completed, and operations have commenced. The new addition increased the capacity of the mill from 60 to 120 tons a day, and called for an additional 1,000 h. p. of electrical energy from the Hydro-Electric Power Commission.

Paper Making and Forest Ranging Schools Reopen

The school of paper making, at Three-Rivers, P. Q., reopened on October 1st, after the summer vacation, while the school for forest rangers, located at Berthierville, P. Q., reopened on September 30th with 55 students enrolled.

Both of these schools come under the jurisdiction of the provincial department of lands and forests, and officials of that department visit them quite frequently.

Eddy Mills Cut Wages

A reduction of approximately 7 cents an hour in the wages paid to unskilled labor went into effect on September 1st at the plant of the E. B. Eddy Company, Limited, Hull, Quebec, and affected about 100 to 125 men. The cut in wage scale was approximately from 40 to 42 cents per hour down to from 33 to 35 cents per hour.

The reduction had been decided upon as a measure of equalizing the rate of wages paid for this class of labor as compared with that paid for the same class by other large plants in the district. It does not apply to skilled workmen, but only to common laborers.

Repulping Old Currency

A series of experiments have been carried on by the Forest Products Laboratories of Canada, Montreal, to develop the best method of recovering good paper stock from the condemned paper currency withdrawn from circulation by the Department of Finance and the various banking institutions, and to ascertain if such a method is commercially economical. Refining of the stock produced under normal cooking conditions was carried out, and by the use of a special washing equipment it was found possible to recover an absolutely clean pulp.

The paper used for the printing of Canadian bank notes is made from pure linen cuttings and is one of the most expensive papers manufactured. It will readily be seen that if the Forest Products Laboratories are successful in their attempt, it will be of considerable importance.

Pulp Stones Manufactured in Western Canada

The manufacture of stones for grinding wood into pulp is now being carried on in Vancouver by J. A. and C. H. McDonald, and promises to be an important industry in British Columbia.

The rock from which the stones are made comes from the MacDonald quarries on Newcastle Island, near Nanaimo, and is reported to be of exactly the peculiar constitution required for the manufacture of groundwood. The demand for a stone exactly suited for the work should be great. Even at the best they last only a year. They range in weight from two to seven tons, and cost anywhere from $200 to $800 each.

Decline in Number of Forest Fires

With the exception of British Columbia there has been an encouraging decrease in the number of forest fires in Canada during the present season, which is doubtless attributable largely to the intensive educational campaign carried on through the newspapers of the Dominion, to the closer co-ordination of efforts on the part of railways with the forestry officers of the Government, and to weather conditions.

In British Columbia during the early part of the summer, weather conditions were very bad, and as a result more than 1,200 forest fires had been reported in that province up to August 1st. In the eastern half of Canada weather conditions were not favorable to forest fires, and as a result a remarkable record has been created as compared with previous years. If the present rate is continued, a new low record will be established.

Water Shipments from Espanola to Toronto

Cargo shipments of newsprint in rolls from the plant of the Spanish River Paper Mills, at Espanola, Ont., are now being made to Toronto by water, which is somewhat of an innovation in transportation to that city, and the local newspapers are reaping the benefit in reduced transportation charges.

The Wahcondah, a large steel steamer belonging to the Union Transit Company, Toronto, arrived at that port recently with nearly 1,100 tons of newsprint, which came down the Great Lakes from Little Current, a distance of about 550 miles, after a rail haul of some thirty-six miles on the Algoma Central Railway.

The cargo was unloaded in about fifteen hours, and other newsprint shipments are expected by steamer before the season of navigation closes.

Several shipments of esparto papers from England were received in Toronto recently, and on the paper being exposed to light it was discovered that the edges had become discolored to a pink shade. The shipments were for use by one or two big printing firms, and it was necessary for the Canadian supply houses to help the printers out of the difficulty.

Efficient Forest Protection

From the lookout towers at Mt. Carleton and St. Quentin a heavy black smoke was observed recently. The readings being reported were plotted and the location on the map gave the place as two miles north of Pollard Brook, a branch of the Parapedia on the inter-provincial boundary between New Brunswick and Quebec. Fire-fighting crews despatched to the scene reported that the smoke had risen from a large smudge fire built on a beach by a fishing party to keep mosquitoes away. The fact that one tower was thirty-six and the other fifty-six miles distant shows the accuracy with which the work of observation is conducted. Later the same towers picked up another smudge made by the same party some distance lower down the stream.

In another instance a settler started a fire in a dangerous and prohibited period, which was picked up at once by a lookout. A forest ranger on being notified went to the scene, and on the way secured a magistrate who accompanied him. The man was caught in the very act of setting a fire, and a fine of fifty dollars was imposed. As the settler repented promptly and did excellent work in extinguishing the fire, the fine was allowed to stand. The remarkable feature of the incident was that from the observation of the fire until the imposition of the fine only fifteen minutes elapsed.

Aught or Naught?

—and the engineer said:

"The old pump is done for, boss—we'll have to have a new one."

When you face the prospect of putting in a new pump, what does the record of your old pump mean to you—aught or naught? When your pump has given you years of service plus —the record of its builder is good. Our history stands for you to read.

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is a production we are proud to put our name plate on. Years and years from now you will be satisfied with your judgment in putting one of these sturdy pumps for regular hard duty in your factory or works.

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Low Water Hampers Rafting in Maritime Provinces

The Nashwaak Pulp and Paper Company, which suspended rafting operations for some time owing to exceptionally low water on the Nashwaak River, has resumed rafting operations. This company maintains a large crew of men along the Nashwaak for the woodlands, boom, driving and rafting operations.

This year the water has been low, compelling the suspension. Last year a suspension was due to a demand for higher wages by employees in their operations. The Nashwaak Pulp and Paper Company rafts the logs from the Nashwaak to the mill at St. John, N. B.

All of the pulp and paper companies are experiencing difficulty in satisfactorily rafting their logs this summer, some of the old timers among the men saying that the water has not been as low in many years as during the end of the present summer.

Vickers of London and Canadian Vickers of Montreal had a fine display of pulp and paper machinery and supplies in Machinery Hall during the Canadian National Exhibition.

Howard Smith Passes Dividend

In view of conditions prevailing at present in the Canadian paper industry, the directors of Howard Smith Paper Mills have decided not to pay any dividend for the third quarter of this year.

While the company has earned its dividend for the past three quarters of the year, the directors deem it prudent to withhold the payment of the common dividend until there is a distinct improvement in the trend of business generally in Canada, so that the company shall be able to maintain its liquid cash position on a conservative basis.

Chicoutimi Mill Operating to Normal Capacity

The Chicoutimi mill of the Chicoutimi Pulp Co., the reopening of which was announced in these columns last month, is now turning out 350 tons of groundwood a day, which is the normal production of the mill. The re-opening of the Val Jalbert mill, which has a capacity of 125 tons of groundwood a day, in under consideration.

The company had a stock on hand of 26,000 tons when the mill closed last February, and this has been reduced to 18,000 tons. It is expected that this stock will soon be disposed of, as there is a promising market in sight for the output for the balance of 1924, and orders are being received ahead for 1925 deliveries.

Improvements Completed at Mille Roches

The Provincial Paper Mills, Toronto, have completed a large new storehouse at its Mille Roches division. The new building is grey stone, 60x120 feet, three stories high, and will be used for housing pulp, china clay and other raw materials. A new steel and gypsum roof has been put on the beater room in which considerable new equipment has been installed. The company has spent about $100,000 in improvements, and its program of extension is now complete.

Fewer Forest Fires in Nova Scotia

In Nova Scotia it has been found that the Fire Prevention Board has accomplished much in reducing the damage by fire in the forests. During 1921 the loss by forest fires reached $3,000,000; in 1922 it was reduced to $2,200,000; and in 1923 the figure was still further reduced to $1,800,000.

Recently, at a convention of the Union of Municipalities held at Dartmouth, N. S., the forest fire problem was given considerable attention.

The head office of the Spanish River Pulp and Paper Mills in the Bank of Hamilton Building, Toronto, Ont., is being overhauled and considerable additional space has been added to the Board Room.

Licensing of Mills Proceeding Smoothly

Since Ontario passed a regulation requiring the licensing of all saw mills and pulp and paper mills in the province, the response has been quite active, and although the new regulation went into effect only in July last already over 500 plants have complied and many applications are coming in daily.

The license fee is a merely nominal one, and will enable the department to keep tab on all operations, cutting rights, amount of timber sawed, etc., and will prevent squatting, pilfering and pirating which have taken place in some instances in the past.

Michigan News

October 1, 1924.

Superintendents Elect Officers

At the meeting of Michigan Division of the Superintendents' Association, September 18, all the old officers were re-elected for the coming year. E. H. Gilman, Bryant Paper Company, chairman; Michael Redmond, Kalamazoo Paper Company, first vice-president; George Pountain, Allied Mills, second vice-president; A. G. Whightman, Hawthorne Paper Company, third vice-president, and Jacob Parent, Western Board and Paper, secretary-treasurer, are the officers for the coming year.

It was decided at this meeting to get Allan Hoben, president of Kalamazoo College, to speak to them at the next meeting, October 16.

The members present were: E. H. Gilman, Bryant Paper Company; Jacob Parent, Western Board and Paper Company; Albert Litner, Allied Mills; Clarence Thorne, Watervliet Paper Company; A. G. Whightman, Hawthorne Paper Company; C. A. Harter, Rex Paper Company; Frank Johnson, Allied Mills; Jacob Kuss, Allied Mills; Mr. Sievert, Michigan Carton Company, Battle Creek; George Pountain, Allied Mills; Michael Redmond, Kalamazoo Paper Company; Howard Hall, Kalamazoo Gazette, and Robert Van Kirk, Dupont Dye Works.

Kalamazoo Paper Company Never Without a Redmond in Last Forty-Five Years

Seven Redmonds, father and six sons, have at one time or another during the last forty-five years been counted among the employees of the Kalamazoo Paper Company and have seen that concern grow from modest dimensions to one of the most important in Western Michigan.

Michael Redmond, present general superintendent of the immense plant with its five divisions, is credited with the distinction of being longest in the point of continuous service with that company. Starting as screen boy in 1882, he has worked steadily forward as third hand, back tender and machine tender. In January, 1899, he was appointed superintendent by President F. M. Hodge and placed in charge of the mill originally erected by the Botsford Paper Company and later purchased by the Kalamazoo Paper Company. when that concern moved from its original location south of the city to the east bank of the Kalamazoo River.

From a one-unit plant, with two machines, the Kalamazoo Paper Company has within the quarter century period grown until today it has five divisions, three being equipped with five Fourdrinier paper machines, while two divisions house twenty-four coating machines.

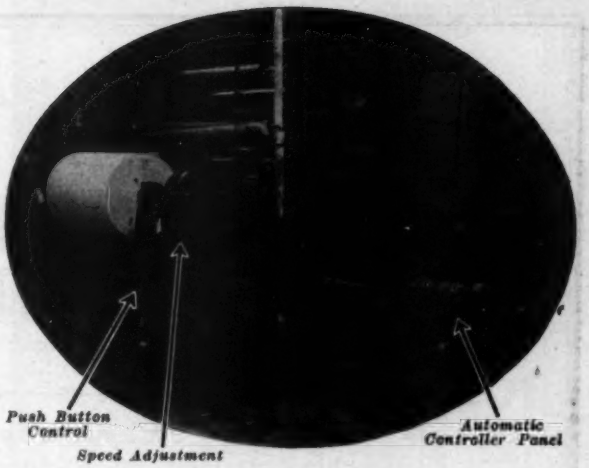
Patrick Redmond, worthy sire of this famous paper mill family, came to Kalamazoo in the '60s, but it was not until about 1880 that he entered the employ of the Kalamazoo Paper Company. His sons, Michael, Con, William J., Charles, Patrick, Jr., and David, followed in his footsteps. "Mike," "Bill," "Charlie" and "Dave" are still at the same job, the former two being superintendents. Con rose to the rank of superintendent and then retired. Patrick J. Redmond worked but four years in the mill, and then retired to take up the practice of law. Dennis, oldest of the Redmond sons, died in 1892, while John, sixth in point of age, is engaged in the automobile industry in Detroit.

According to responsible authorities, Mike's determination to stick to business and become an industrial magnate spoiled a perfectly good ball player. Back in the '80s he was counted as sure big league material behind the bat, being not only a good catcher, when mitts were unknown, but also a good thrower and crack batter. Despite laurels gained on the playing field, he refused to permit anything to interfere with his business career, which has resulted in his climbing to the post of general superintendent of one of the greatest concerns in the Kalamazoo valley. He is also secretary of the Western Board and Paper Company.

Employees Hold Fall Fair

Fruits, cut flowers, vegetables and fancy work in great profusion arranged on long tables in the welfare department of the Kalamazoo Paper Company, constituted the first fall fair given by the employees of that concern. The event, which was an innovation in local industrial welfare activities, was under management and direction of Mrs. Maud Young and was the outgrowth of the Kalamazoo Paper Company's garden club, formed three years ago. It was designed to show results of the development of that club's progress.

This first fair enlisted exhibits from 150 employees. The



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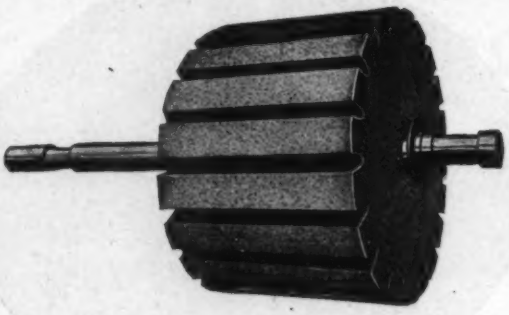

Make Stronger Paper with Genuine

BASALT Lava Stone Beater Rolls & Bedplates

(U. S. Patent Nos. 1149381 and 1173531)

In the beater, better hydrated stock in shorter beating time; on the machine, stronger, more uniform and better felted papers can be made with the Genuine Basalt Lava Stone Rolls and Bedplates.

We offer a complete service to mills now using, and to mills desiring to use the Basalt Lava Stone Beater Rolls, Bedplates and Jordan Filling, saving the annoyance and difficulties encountered in buying abroad. Rolls manufactured in this country, and adapted to American practice.

The Noble & Wood Machine Co., Hoosick Falls, N.Y., U.S.A.

vegetable display included high grade specimens of everything usually found in the well-kept Michigan garden. Women employees of the mill were represented by an unusually fine line of fancy work.

Cash prizes will be awarded at the Kalamazoo Paper Company's annual winter picnic.

Glendale Mill Is Assured of Success

The Glendale Division of the Kalamazoo Vegetable Parchment Company, in operation for the past five months, has passed through the experimental stage and is now an assured success, according to R. A. Hayward, general manager of the company and assistant to Jacob Kindleberger, president.

Every day 20,000 pounds of waxed paper are being run through the plant, most of it being old stock that has been piled in the yards while the mill was being whipped into shape. The results show that a very fine quality of pulp is being produced and a large percentage of the wax is saved and reconverted for future use.

By the process used, the waxed paper is shredded and then passes through an extractor where the wax is washed from it with a chemical substance very similar to gasoline. The paper stock then passes into a steaming tank where the solvent is boiled off, the stock being carried over a washer and wet machine and is then ready to be converted into paper again. The solvent, with the wax, passes into a steam still, where the solvent is distilled and used again. The wax accumulates gradually at the bottom of this still and each week can be pumped off and used in the waxing department.

The Glendale division is operated with three shifts of seven men each, with four men working daytime to take care of maintenance and handling the wax. George Smith is general superintendent in charge, Robert True being assistant and handling the night crew.

Bradford Leases Building

Clarence A. Bradford, who is launching in Kalamazoo a new company for the manufacture of coated paper, has purchased the Dunkley Company's property on Fulford street for conversion to his own use. It is planned that within 60 or 90 days actual production of coated stock will be possible.

The property taken over has an area of 305 feet north and south by 595 feet east and west. It contains a main factory building of brick, concrete and steel throughout. This building is 120 feet by 260 feet, large enough to accommodate four of the latest designed Waldron coating machines and auxiliary equipment.

There is also a power plant, with all the capacity needed at this time and a fine heating plant, making possible the installation of a drying system in one section of the plant. A sidetrack from the Grand Trunk railroad runs to the property.

Within the next two weeks, Mr. Bradford expects to perfect his new organization with a capital of $200,000.00. He has already placed his order for four 73-inch Waldron coaters, said to be the heaviest in the valley, and also carrying more brushes. He will employ about 100 men and women at the outset.

Kalbfleisch Buys Plant at Kalamazoo

The plant of the Michigan Silo Company, which includes 11½ acres of ground, was purchased by the Kalbfleisch Corporation of New York for the manufacture of their line of products here. This is to be a completely equipped branch plant to supply the trade in this section.

The new plant will be known as the Kalbfleisch Corporation of Michigan, which is to be incorporated under the Michigan laws. L. R. Verdon, president of the Paper Mills Supply Company of Kalamazoo is planning on moving his office from the Park-American Building to the new Kalbfleisch plant, as soon as the men are through remodeling the offices. Mr. Verdon will still continue to handle this line.

The MacSimBar Paper Company, Otsego, is installing a new system of size tanks in its beater rooms, the equipment being built by the Kalamazoo Sheet Metal Company. The tanks are made of 14-gauge galvanized iron, ten small ones being 30 inches in diameter and six feet tall; two large ones, each, eight feet six inches in diameter and six feet tall, capable of holding 2,500 gallons of size. Regulation iron fittings are used throughout. The same type of equipment has just been installed by the Kalamazoo Sheet Metal Co. in the Bardeen Division of the Allied Paper Mills, Otsego, Mich.

W. H. Scott, chief engineer of the Kalamazoo Paper Co. for a number of years, has been promoted to mechanical superin-

tendent of the Kalamazoo Paper Co., in charge of maintenance of the different divisions. Mr. Arthur Adams is now chief engineer.

Eliminating System Being Built

The Kalamazoo Sheet Metal Company is now building a new drying and steam eliminating system, which is to be installed in the beater and cooker rooms of the Michigan Paper Company, Plainwell.

It provides for four runs of galvanized iron piping the full length of each room, this pipe ranging from 50 inches to 12 inches in diameter with two outlets every eight feet. Draft will be induced by a Clarage fan. The Michigan Paper Company has completed the installation of a new roof over that section of its mill.

Harmony Club Elects Officers

At the opening meeting of the season, the Harmony Club of the Chamber of Commerce elected the following officers: President, Geo. Steers; vice president, Geo. Pountain, Allied Mills; secretary, Richard Rehm, Western Paper Makers Chemical Co.; treasurer, James Shakelton. With John Ross, Bryant Paper Co., these comprise the board of directors.

The Harmony Club, of which N. M. Brisbois was formerly president, was organized for the benefit of employers of labor. Men connected with the paper industry comprise the majority of the membership of this organization.

New England News

October 1, 1924.

Foreclose Mortgage on Mill

A bill was filed in the Federal Equity Court for the District of Massachusetts on Thursday, September 25th, by the Old Colony Trust Co., petitioning for a foreclosure of the mortgage against the American Writing Paper's property. The Old Colony Trust Co., represented by their solicitors, quoted the indenture of the mortgage which provides that if there is a default of interest continuing in excess of 60 days, or if receivers are appointed for the property, the mortgagees may treat the entire principal of the bonds as due and payable and may foreclose. Bonds totaling $11,870,000 are in the hands of the public, although there is some $700,000 held by the bank in the sinking fund. Plants covered by the mortgage in four states, Massachusetts, Connecticut, Ohio and Wisconsin, have a total value of over $14,000,000, according to estimates of examining engineers who recently completed survey.

Merchandise creditors who have filed claims show an aggregate of $682,000 of unpaid bills prior to receivership, since the company has been operated on a pay as you go basis.

It is understood from Sidney L. Wilson, receiver for the American Writing Paper Co., that there is no necessity for this suit being instituted except that the legal formality is one that must necessarily take place sooner or later, either to protect the interests of the bondholders or to effect a reorganization of the Company. "Liquidation of the Company is farthest from the thought of anyone," writes Mr. Wilson, "and the action should be considered as an evidence of an intent for early reorganization rather than liquidation. This Company is today physically in better shape than it has been for many years. The quality of papers manufactured is greatly improved, and the operations during the past year have been considered unusually good under the existing conditions."

New England Week

September 15 to 20 was New England Week, during which the six New England states staged exhibitions, rallies and meetings at many places as a means of concentrating the thought of New England people on their industries of this section. The paper industry's exhibits were notable, particularly in the windows of Boston department stores, where whole sections were given up to presentations of paper, the raw materials which are used in its manufacture and beautiful printing effects on the finished products.

One of the most effective exhibits was given by Tileston & Hollingsworth Co., in the windows of the Congress Building. Complete sets of printing on their many papers were shown, together with pulp, rag and other raw material specimens.

The Moosehead Paper Co., of Skowhegan, Me., chartered last month under Maine laws with $300,000, has an ambitious program of reconstruction and expansion for the mills it requires at Skowhegan, Me., formerly operated as the Skowhegan Paper Co. Boston capitalists are understood to be

Four years of steam and dampness

THIS letter from a big paper mill tells its own interesting story:

"We have had in use in our mill for four years a 12" Graton & Knight Standardized Series Belt on a Jordan engine drive. This belt has been constantly exposed to steam and dampness and it has never been necessary to take it up or give it any attention. From the condition it is in it is apparently good for many more years' service. At the same time we bought this belt we almost completely equipped our mill with Graton & Knight Belts and have had the same satisfactory service from the other belts of this brand."

The Standardized Series is a grouping of Graton & Knight Leather Belts to give the right belt for the right job—all through the mill.

Standardized Series Belts stand up under paper mill service because their honest leather resists water, steam and oil. Guaranteed waterproof and not to come apart at the laps or plies. They will save money in your mill.

Write to-day for book 101-S, which tells you the true economy of *water-proof* Standardized Leather Belting in paper mills.

THE GRATON & KNIGHT MFG. CO.
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efficient durable economical

an ideal belting for paper mill drives

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DUXBAK BELTING TRADE MARK

Thoroughly Waterproofed and Built for Service

Chas. A. Schieren Company

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Branches and Distributors in All Leading Cities

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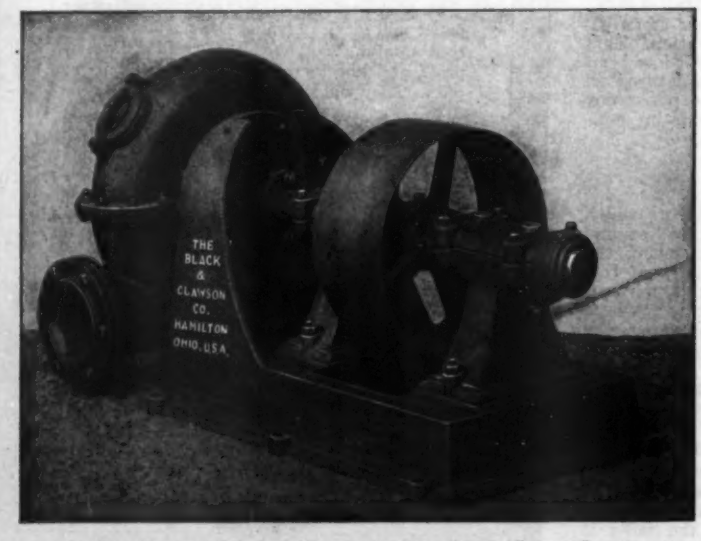
The BLACK-CLAWSON CO.

Leading Builders of Paper and Pulp Mill Machinery

Hamilton, Ohio, U. S. A.



Fan Pumps of Iron or Bronze in Sizes from 2" to 12".

ESTABLISHED 1873, and since we have steadily grown and stood forth as leaders in the manufacture of paper making machines and other equipment for every requirement in Board, Pulp and Paper Mills.

Our large plant and special equipment with skilled and trained help enable us to render efficient and prompt service and satisfaction to a customer.

The best is none too good. Let us serve you.

back of the new company, and David Albert Chapman, well known Beacon Hill clubman, is president, with John J. Moore, of Moore & Co., civil engineers, another incorporator. It is understood that the company contemplates the doubling of the beater capacity in the old mills, with the probability that another cylinder or fourdrinier will be added later. Machinery for the manufacture of paper bags is also being considered according to reliable reports from Skowhegan. The plant has recently resumed operations under a new superintendent.

The S. D. Warren Paper Association, comprising distributors, employes and others in the great organization making and selling that company's lines, met at the Poland Spring House, Me., during the week of September 22, for sports, conferences and addresses. The principal address delivered on the occasion of the banquet the last evening of the gathering was by E. M. Swasey, publisher of the New York American. His talk was on "Selling Is Not Taking on Order, Selling Is Service." Prominent members of the company present included Samuel D. Warren, grandson of the company's founder, W. F. McQuillen, treasurer A. Storrs & Bement of Boston and president the National Paper Trade Association, Roger D. Smith, president of the Warren Association.

Proving that despite the multitude of bond papers on the market a good line reasonably priced has plenty of possibilities of success, the Poland Paper Co. has introduced a third Waterfalls paper in the shape of Waterfalls cover. The Mechanic Falls, Me., paper makers introduced Waterfalls bond only two years ago and its success has been remarkable when price and quality are considered. Entering a highly competitive field, this and Waterfalls ledger were big sellers from the start. There is every reason to expect as much from Waterfalls covor.

The Federal Reserve Bank in its monthly survey of New England industrial conditions reports for Massachusetts its paper industries as of October 1 about 70 per cent of capacity operations for the industry as a whole. Newsprint production in New England, according to the bank, has increased during August and September. Holyoke fine paper mills report only 23 per cent of the total on full time, although manufacturing activity increased 3 per cent last month.

The contract between the Canadian Realty Co., of Calais, Me., and the International Paper Co., on which depended whether the Realty company could carry on its business, has been negotiated. It provides for the immediate purchase of 10,000 cords of pulpwood for I. P. Co. mills. The Canadian Realty Co., whose chief business has been the acquisition of pulpwood for the big company, has been in financial difficulties owing to depreciation of pulpwood.

Slackened operations greeted the trade in the leading New England board mills on October 1, but from the middle of August up to the present time the Haverhills division of Robert Gair Corp., Bird & Son, Uncas Paper Board Co., Windsor Locks Division, American Writing Paper Co., New Haven Pulp & Board Co. were operating at capacity either five or six days weekly.

Strathmore Paper Co. exhibited a collection of fine business printing done on their papers in Graphic Arts Hall, Boston, from September 23 to 26. The collection was gathered from all parts of the country. It was open to the public and the company's four local distributors made the most of the opportunity by inviting their customers to view the exhibit.

Full time operations are the rule in Fitchburg, Mass., particularly at the mills of Crocker, Burbank & Co. and the Fitchburg Paper Co., both manufacturers of paper for Curtis Publishing Co.

Bird & Son, Inc., has increased its capital stock by $1,000,000. It has accomplished this by issuing 10,000 additional shares of preferred par value $100 to be issued as stock dividend in the ration of one new share to every twenty shares of common now held.

A new house organ to be known as How has appeared from the offices of Tileston & Hollingsworth Co. Its avowed purpose is to raise the standard of printing throughout New England and incidentally to show most effectively the many papers produced by this concern.

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Write for the Ryerson Journal and Stock List —the "Key" to Immediate Steel

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There is a Difference

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Cleveland WORM GEAR REDUCTION UNITS

and other types of speed reducers

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—is simple in construction
(there are only two major moving parts)

—saves space
(the right angle drive does it)

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(runs in a bath of oil)

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(in a dust-proof, oil-tight housing)

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A Single Cleveland Worm Gear Reducer Driving Mill Line and Crackers. Motor 400 H. P.—1200 R. P. M.—Speed Reduction 14 2-3 to 1

Compare—then buy Clevelands

All of which means Lower Maintenance Costs—Longer Life—Higher Efficiency

The Cleveland Worm & Gear Co.

America's Pioneers in Worm Gearing

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FOURDRINIER WIRES

Dandy Rolls *Cylinder Molds*

Brass, Copper and Iron Cloth

Bank and Office Railings

WIRE SIGNS

Cheney Bigelow Wire Works

Established 1842 SPRINGFIELD, MASS.

The Valley Paper Co., of Holyoke, Mass., has been granted a permit for the construction of a $25,000 addition to their main plant on Water street, Holyoke, Mass. The addition will be of brick, concrete and steel, will be two stories in height and will be used for present needs and future expansion.

Maine Public Utilities Commission will hold a hearing at Augusta on October 21 to hear arguments of the Maine Central Railroad in its plea for a rehearing of the entire pulpwood rate case which was recently decided adversely to the railroad.

Hollingsworth & Vose Co. has been making needed repairs to its East Walpole mass mill during the past fortnight, while the mill was closed. The West Groton plan was operating continuously at full time.

International Paper Co.'s steamers bringing pulpwood from Dalhousie, N. S., to Portland, Me., for the Maine mills of the company has also been used to carry wood up the St. Lawrence to the Three Rivers, Quebec, mill.

Full time operations have been reported from the Parker Young Co.'s mills at Livermore Falls and Lincoln, N. H., since the union employes acceded to the company's offer of 5c an hour reduction in wages and loss of union recognition after a fruitless strike of two months.

A large quantity of pulpwood belonging to Brown & Co. has been caught in an improvised boom at Lewiston, Me. This was wood carried away by the floods of last month.

Owing to repairs to the foundation of mills of Bird & Son at Phillipsdale, R. I., the company has reduced its purchases of raw materials for a period of three weeks.

Ohio News

October 1, 1923

Gardner-Harvey Team Wins Title

The interest of paper mill men in Middletown and this vicinity was centered during September on the baseball team representing the Gardner & Harvey Paper Company in the K. I. O. (Kentucky-Indiana-Ohio) semi-professional league, and in the state series for the championship of Ohio.

Gardner-Harvey clinched the first pennant ever brought to the Paper City on September 14 by defeating the Ludlow, Ky., team in the last of the three-game finals to decide the winner in the league.

On September 21 play started at the Gardner-Harvey park in the elimination games for the state championship. Greenfield and Springfield, teams tied for the first place in the Western Ohio League, played off their tie at the Papermakers' field preliminary to the game between G-H and Springfield, who won the first encounter by a sensational spurt in the ninth inning which netted them eight runs. The Western Ohio champions were defeated by a score of 13 to 1.

The second game of the series, to have been played at Springfield on Sunday, Sept. 28, was called off because of rain and will occur in October.

Baseball Team Is Feted

Honoring the Gardner-Harvey baseball team as the first to bring a pennant to Middletown, the Retail Merchants' Association entertained the team members, officials of the athletic association, officials of the paper mill, and one hundred citizens fortunate enough to procure tickets at a banquet at the Hotel Manchester, Friday evening, September 19.

Bert Lawler, secretary and treasurer of the retail men's organization, was toastmaster. E. T. Gardner, president of the Gardner-Harvey company, Tom Harvey and George Harvey, of the same company, expressed their appreciation of the team.

John M. Dugan, president of the K. I. O. League, was the chief speaker of the evening, while Bennett Chapple, of the American Rolling Mill Company, opened the program of speechmaking.

The second banquet in honor of the K. I. O. pennant winners was given by the officials of the Gardner & Harvey Paper Company, Friday evening, Sept. 26, at the Butler County Country Club. Officers of the Athletic Association of the mill were also present.

John A. Dugan, president of the K. I. O. semi-pro league, was present to present the cup to the team, while to each player was given a solid gold pendant shaped like a miniature baseball with the player's name engraved on it. These trophies

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IN PAPER making machinery Gurney Ball Bearings—Maximum Service—Maximum Capacity type—offer a real solution of your bearing problems.

Using more balls of the largest permissible size enables Gurneys to safely carry greater loads than other bearings of equal size.

They are well suited to the peculiar requirements of paper making machinery where capacity and endurance—together with low maintenance costs—are essential to safe and profitable operation.

Our engineers are at your service—when you want assistance for the elimination of friction ask their advice.

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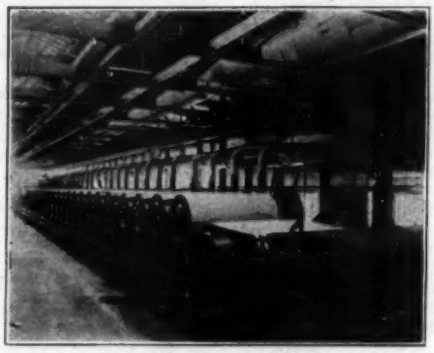
Waldron Equipment for Coated, Gummed, Wall and Abrasive Papers



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Supplies the air, for absorbing the vapor, directly to the machine. Increasing production and decreasing back pressure.

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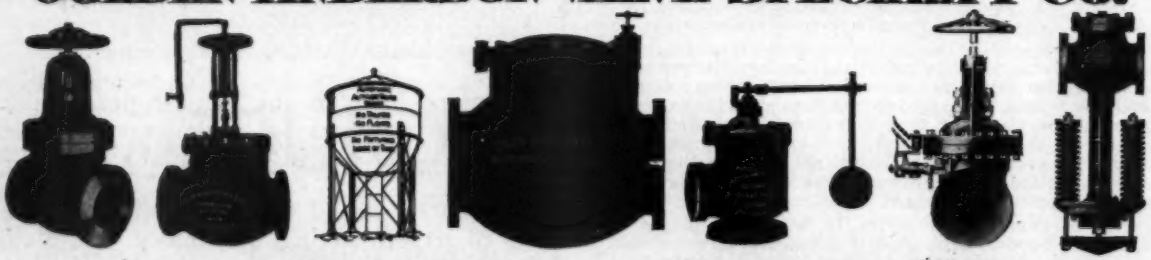


AUTOMATIC CUSHIONED STEAM AND WATER-SERVICE VALVES.
"We Challenge to Test for Merits Any Automatic Steam or Water-Service Valves in the World"
1240 FULTON BUILDING. PITTSBURGH, PA.

WE-FU-GO AND SCAIFE WATER

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO., PITTSBURGH, PA.

were the gift of the company, while the cup was given by John A. Spinney, the "grand old man of semi-professional baseball," who at the age of 70 is still an ardent fan and takes delight each year in presenting the cup.

After the banquet, during which the Gardner-Harvey orchestra played, E. T. Gardner, acting as toastmaster, extended the congratulations of the company to the team members, assuring them of the appreciation of the officials for their success and pledging them the continued support of the company.

Tom Harvey expressed the wish that the same spirit that brought a pennant to the organization could be transferred to the making of paper in the mills of the company, for he realized fully what this would mean to the mills of the valley.

H. L. Dibble, president of the athletic association, spoke of the way the Gardner-Harvey team has been "sold" to Middletown and voiced his satisfaction with the co-operative efforts of the team.

In his talk Colin Gardner fancied that he would soon attend a banquet given the Papermakers' team when they have defeated the winners of the world's series. At this point John M. Dugan was introduced and he accompanied his presentation of the cup with appropriate remarks.

Bennett Chapple, George Harvey, Walter Hadley, manager of the team, J. C. Leach, W. H. Swan and several of the players concluded the speechmaking.

Then came the convulsing number of the program with the appearance of "George Alexander Mann, Mayor of Northville," a blackface comedian from Dayton, who kept the guests in an uproar throughout a lengthy monologue of fun-poking at every member of the team and the officials of the company. The stunt was a scream from start to finish.

Typothetae Visits Champion Mills

The United Typothetae of America, in convention at the Hotel Sinton, Cincinnati, for two days in September, visited the Champion Coated Paper Company in Hamilton, Ohio, and enjoyed a dinner at the Elks' Club after the trip. The delegation journeyed to Hamilton in a special train switched to the belt line to take them direct to the Champion mills.

The dinner served at the Elks' Club ended the Hamilton visit for 150 delegates. Local and visiting members made talks, telling of the history of the Champion mills and their progress and development, including the famous gravity system employed to convey materials from one part of the mills to another.

Miami Superintendents Meet

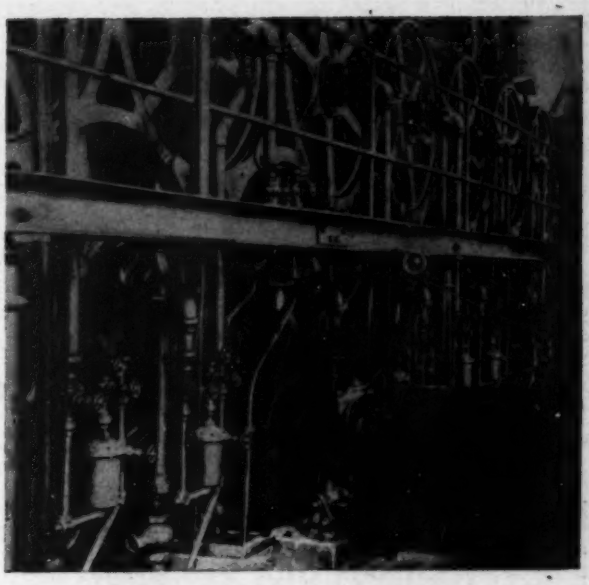
Fifty members of the Miami Valley Division of the American Pulp and Paper Mill Superintendents met Saturday evening, September 27, for a seven o'clock dinner at the Hotel Manchester. They were addressed by Peter J. Massey, superintendent of the William F. Hall Printing Company, of Chicago.

Massey spoke on the subject "Printing Matter," advising the assembled millmen on the mistakes made in making and printing paper. His talk included a minute description of how and why rotary presses have increased production.

"It is necessary for the printer and papermaker to work hand in hand," he continued, "and it is also the duty of the salesman to understand the needs of the customer and to advise him how and what to buy. Superintendents should work with their salesmen in order to give the customer the exact product he has ordered. Ther are many problems to our business which may be partially solved if each man remembers that the business is built on service."

Officers were elected for the year: L. C. Murphy, Marysville, chairman; Homer Ferguson, of Hamilton, first vice-chairman; Benjamin Bishop, of Middletown, second vice-chairman; F. C. Cole, of Lockland, third vice-chairman; G. S. Martindale, of Hamilton, secretary and treasurer.

The men who attended were: C. A. Weisshaar, F. C. Cole, George Engest, William A. White, J. Twochtman, Richardson Company, Lockland, O.; Jack Smith, Sr., Jack Smith, Jr., and B. M. Bishop, Gardner-Harvey Company; E. T. Judd and Tom O'Flynn, Wardlow-Thomas Company; R. L. Emminger, H. W. Server, Adam Lindsay, W. W. Sunderland, A. H. Nevills, Rufus Eck, John MacMurray, O. P. Gephart, J. E. Romig and C. A. Miller, of the Miami Paper Company; John W. Perry, Henry M. McGohan, P. F. Chester, Eugene Botts, John Yauch and Walter Rhoades, Raymond Bag Company; P. E. Ruppert, Albert Lester and E. T. Coughlin, Franklin Coated Paper Company; C. R. Crawford, J. A. Hamm and H. D. Martindale, Shartle Brothers Company; V. Friedrich, Beckett Paper Company; J. Adam Ritz, Ohio Paper Company; F. E. Moser, Oglesby Paper Company; Fred B. Zartman, Fiber Board & Paper Company; Thomas H. Keogh, Dayton, Ohio; L. T. Mur-



The Armstrong has become a part of the paper industry

BECAUSE draining of condensation is an exacting part of paper making, the paper industry has been quick to recognize steam trap merit—and the Armstrong has been widely chosen as the paper mill trap.

No other trap has been able to rival it for paper mill service because no other trap can duplicate the advantages of the Armstrong submerged bucket principle.

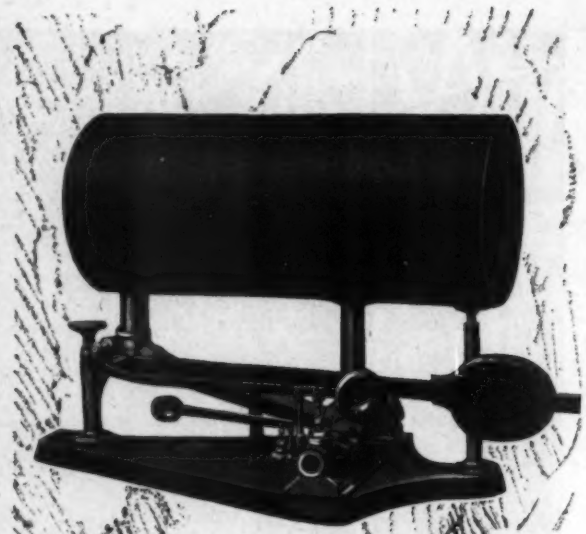
The traps illustrated above are draining a paper machine dryer at the West Virginia Pulp and Paper Company mill at Tyrone, Pa. Each dryer is drained with an individual and standardized connection so that the traps are quickly removable and interchangeable. Careful tests have demonstrated that maximum efficiency is obtained in draining paper machine dryers with Armstrong Traps.

ARMSTRONG MACHINE WORKS
322 Steam Saving St. Three Rivers, Mich.

The Standard Armstrong Trap is furnished for pressures from 0 to 300 lbs.—for service on vacuum where inlet pressure is greater than outlet pressure—for draining water from compressed air expansion tanks, separators, etc.—for service on grease. The Armstrong Special is furnished for pulsating pressures.

Armstrong Steam Trap

PIIO-M-RTG



The Coal Man Pays for Your Morehead System

IN MONEY actually saved on your fuel bill the Morehead Back-to-Boiler System will pay for itself many times over.

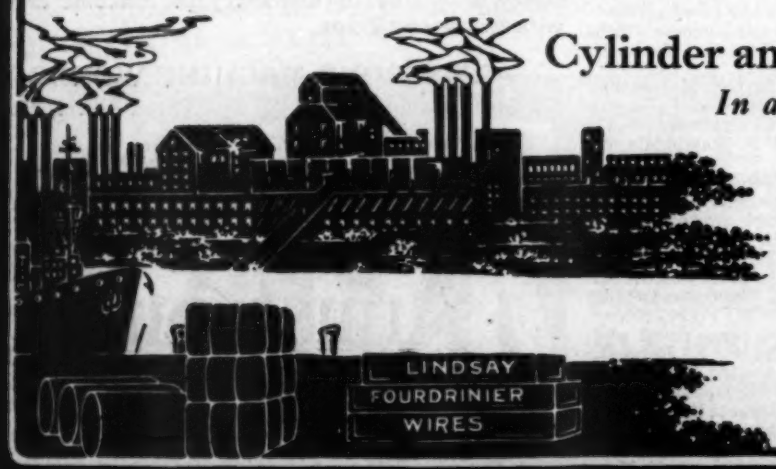
It will drain the condensation from your steam heated equipment and return it to your boilers as high temperature boiler feed water.

Our steam drainage engineers will gladly confer with you.

Morehead Manufacturing Co.
Dept. O, Grand River Ave., at Warren
DETROIT MICHIGAN

136

LINDSAY WIRES
are
DURABLE AND DEPENDABLE
Made in all sizes



Cylinder and Washer Wires
In all Meshes

The Lindsay Wire Weaving Company
Collinwood Sta. Cleveland, Ohio

phy, St. Mary's; R. V. Jenkins, G. S. Martindale and Homer Ferguson, Hamilton; Howard Stansell, West Carollton Parchment Company; Charles L. Blair, Fairbanks Fiber Box Company; Charles E. Raney and Walter Potts, Mid-West Box Company; A. M. Hinkson and R. E. Pohl, Peerless Paper Company, and Walter Holzberger, Champion Coated Paper Company.

Arthur Leon Rieger

Stricken by a relapse of heart trouble, Arthur L. Rieger, president of the Peerless Paper Company and director of the Mead Pulp & Paper Company, died at his home in Dayton, Ohio, September 28, 1924.

One of the oldest in point of service of the men who developed paper making as a Miami Valley industry, Mr. Rieger was forced reluctantly to abandon his business activities after his first attack a year and a half ago, when he tried to get back in harness on recovery.

He was a typical example of the American business man who begins at the bottom and works to the top. Beginning his career as a paper maker with the H. E. Mead Company, he served an apprenticeship of nine years that ended with his going to the Mead Paper Company as bookkeeper, from which position he climbed to directorship with the Mead interests and to presidency of the Peerless.

Mr. Rieger was a thirty-second degree Scottish Rite Mason and a Noble of Antioch Temple, a member of the Dayton City and Engineers' clubs, active in Y. M. C. A. work, and early in his career became closely associated with many civic bodies and movements looking to general social betterment.

He is survived by two sons, L. P. Rieger, president of the Rieger Investment Company, and N. M. Rieger, of the Peerless Paper Company.

In answering the community standard, set up by the American Real Estate Board, for the measurement of a city by men seeking a business location, a Middletown paper has brought out facts pertinent to the paper industry of this locality:

Of the tonnage shipped over the three railroads serving Middletown annually, there are 20,000,000 tons of paper.

The industrial payroll is $12,000,000 annually for the city's 9,000 employes.

The paper industry in Middletown is diversified, the products ranging from the finest tissue paper to writing paper, blotting paper, filter paper and boxboard.

The Miami Paper Company, of West Carrolton, Ohio, has purchased from the American Engineering Company, of Philadelphia, two 8-retort, 21-tuyere, Type H Taylor stokers for use in their plant at West Carrolton. These are in addition to the Taylor stokers already installed in their plant.

Exactly 271,805 ballots, or about three tons of paper, will be used in Butler county in the November elections, it was learned in connection with the awarding of contracts for the printing of ballots to the Nonpareil Printing Company.

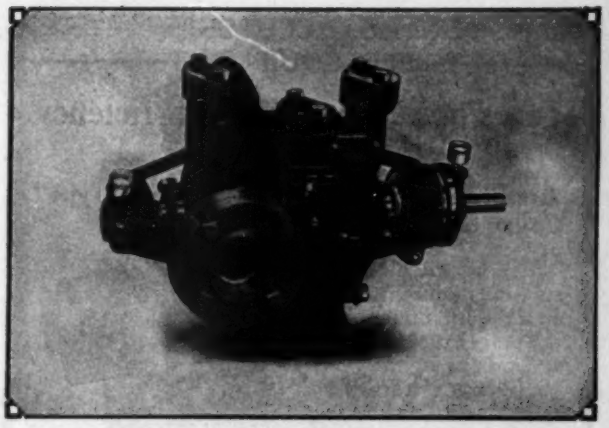
Among the patents granted during the month was one to Arthur R. Harvey, of the Gardner Harvey paper mills, who has been granted a patent on an instrument for the automatic determination of moisture in paper or textiles.

Lightning as a Forest Destroyer

Lightning is the only cause of forest fire that can not be prevented by man. It sets over half the fires reported annually in the northern Rockies, says the United States Forest Service, and is responsible for various lesser percentages elsewhere, down to Florida, where none have so far been reported. The difficulties presented to the Forest Service and State or private fire protection organizations by lightning fires are mainly that they occur in high, inaccessible locations, that there are sometimes twenty or more set during one storm, and that they often smoulder in the stricken tree unnoticed for days, only to flame forth when the woods are dry again and the wind rises.

The only recourse of those who would protect the forests is to study the course, nature and general behavior of lightning storms, striving to anticipate the more dangerous ones, and to be ready for instant response to the fire signal.

New telephone directories which recently replaced the old ones in Toronto yielded a firm of waste paper collectors 100 tons of old paper. It is also interesting to note that the trimmings from a new issue of catalogues put out by one of the big department stores in Toronto yielded 36 tons of paper.



Jenninga Hytor for removing the condensat'on water from paper mill dryers.

Removes the condensation water rapidly and regularly

Air, as well as the condensation water, must be rapidly and regularly removed from the dryers if efficient drying of the paper is to be secured. For this purpose the Jennings Hytor, of the type shown, is widely used with marked success.

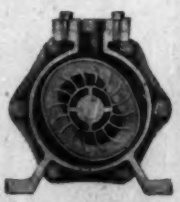
The Jennings Hytor consists essentially of two independent turbine units—an air pump and a water pump, combined in a single casing. Impellers of both units are mounted on the same shaft. By handling the air and vapors independently of the water, about 50% of the horsepower otherwise required is saved.

The Jennings Hytor is positive in action and reliable in operation. It has only two moving parts, the impellers. All complicated mechanisms such as valves, gears, pistons, crankshafts, etc., are dispensed with.

The Jennings Hytor can always be depended on to help keep the dryers at top-notch efficiency. Write for descriptive literature.

Unique principle of operation of Jennings Hytor

The rotor, consisting of a cylindrical hub around the periphery of which are chambers or spaces formed by heavy shrouds cast integrally, revolves freely in an elliptical casing or housing filled with water.



As the rotor turns, it carries the water around with it. The water, under the influence of centrifugal force, is compelled to follow the contour of the casing, and alternately to enter and leave the rotor chambers, twice in each revolution.

As the water recedes from the rotor, air is drawn into the chambers through the inlet port. As the water is subsequently forced back into the rotor by the converging casing, the air is compressed and then discharged from the rotor through the outlet port.

Jennings Hytor

NASH ENGINEERING CO SOUTH NORWALK CONN

"HILL CLUTCH"
MILL EQUIPMENT

Years of Service at Full Efficiency —Not First Cost

Are Proof of the Merit of "Cleveland Type" Collar Oiling Bearings.

CLEVELAND TYPE
Collar Oiling Bearing
(Pat'd.)

Forced oil circulation maintains an oil film under the revolving load and carries the shaft free from metal contact with the bearing. This anti-friction action is automatic and requires oil renewal only at long intervals.

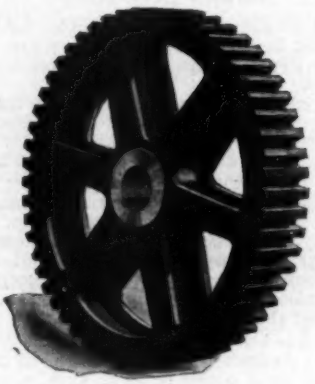
These bearings are made in all sizes from $1\frac{7}{16}$" to 12" in diameter, and for any Ball and Socket or rigid mountings. Either kind have positive four way adjustment, a feature of great value and only found in the "Cleveland Type" Collar Oiling Bearing.

The Hill Clutch Machine & Foundry Co.

General Office and Works
CLEVELAND, OHIO

New York Office
50 Church St.

GEARS

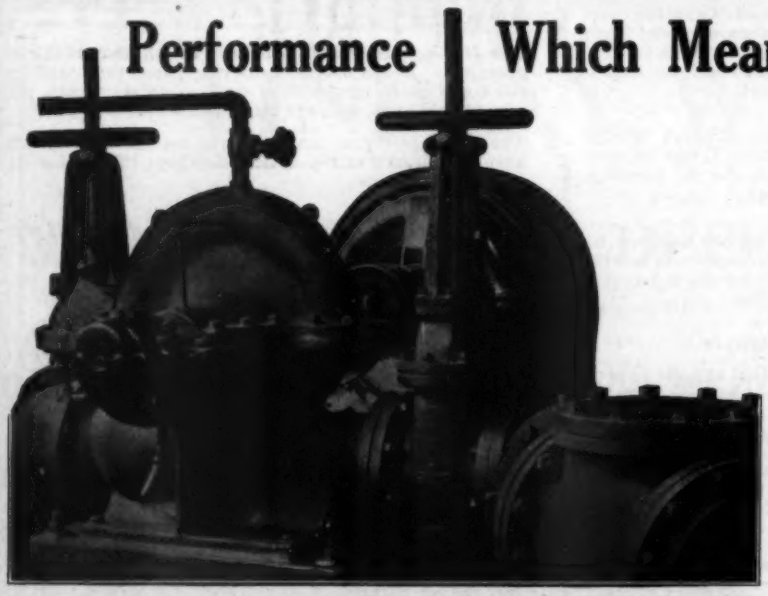


All kinds—types and sizes.
16,000 different patterns.
Made by improved machine moulding method.
A skilled organization of 81 years' experience.
A gear service unequalled.

Catalog?

Poole Engineering & Machine Co.
BALTIMORE, MARYLAND
Gear makers since 1843

Performance | Which Means Savings



Pump No. 2014 in a Michigan paper mill was opened for the first time after nearly six years' operation to renew the wearing rings and shaft sleeves. The runner did not show any appreciable wear and the only expense up to that time was one set of packing and changing the water seal piping which had become stopped up with algae. Maintenance expense 1¼ percent a year.

Combined Responsibility With Any Kind of Drive

ALLIS-CHALMERS
MILWAUKEE, WIS. U. S. A.

Wisconsin News

October 1, 1924.

Maintenance and Construction Crew of Kimberly-Clark Niagara Mill

This picture shows the maintenance and construction crew of the Niagara Mill, one of the units of the Kimberly-Clark Company. The picture was taken on the occasion of boosting

their safety man over the 200-year mark, for which they received the prize for the second time. The prize consists of a crisp new $5 bill for each individual, in addition to a safety watch fob.

This crew consists of about one hundred men who have now passed one thousand consecutive days without an accident. This is one division of the crew which laid claim to "the safest paper mill crew in the world."

Anyone who understands the work that a paper mill maintenance crew must do will agree that this is a wonderful record. The superintendent of this record breaking crew is F. W. Johnson, shown in the front row, seated, the fourteenth man from the left. He is a regular guy and one of the gang, which is probably one of the best reasons for their good safety record.

They challenge other maintenance crews to show a better record.

Installing Bark Press

The Consolidated Water Power and Paper Company of Wisconsin Rapids, Wisconsin, have placed an order for a Giant Bark Press with the Nekoosa Motor and Machine Company of Nekoosa, Wisconsin, manufacturers of these fuel saving machines.

This machine will be installed in the plant of the Interlake Pulp and Paper Company, at Appleton, Wisconsin, which is one of the many mills owned by the Consolidated company.

Paper Company to Install Yankee Machine

The Marinette & Menominee Paper Company are making ready for the installation of a new 132-inch Yankee machine in their mill at Marinette, Wisconsin.

This machine will be located in a new building built between the existing walls of the number 1 and number 2 machine rooms. The new part of the building will be constructed of reinforced concrete with a wood roof carried on steel trusses. The machine itself will be located over the present engine room.

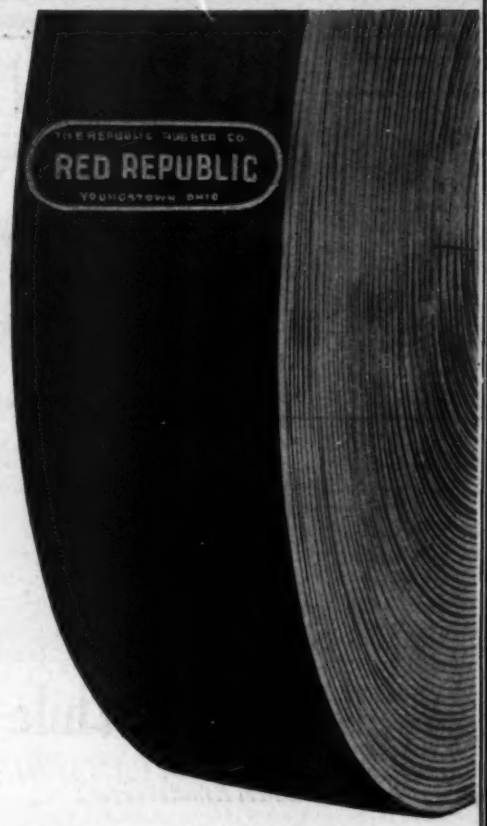
The new machine is now being built by the Beloit Iron Works, of Beloit, Wisconsin. The machine will be equipped with all the latest devices and improvements, such as motor driven shake, removable Fourdrinier and such other improvements. The big dryer will be 12 feet in diameter, and will be 132 face, provided with a second pressure roll.

The machine will be equipped with Nash Suction Pump, Bird showers and a five-roll calender stack. The winder, furnished by the Cameron Machine Company, is to be their Model No. 1, which is 127 inch trim with ten slitters and a motor driven cutter grinder.

The machine will be driven by an Ames 12 by 14-inch twin engine through variable speed lineshaft, and this drive will enable the machines to operate at speeds from 125 to 700 feet per minute. The suction pumps, fan pumps, and the rest of the auxiliaries of the constant speed end will be driven by individual motors.

A save-all system and whitewater chest will be built in as part of the foundation for holding the machine.

The dryer is to be equipped with an all-metal hood and a Briner Economizer furnished by the J. O. Ross Engineering Corporation is to be installed.



REPUBLIC BELTS

—and your dealer

Try a **RED REPUBLIC** or Double Cross Belt on your machines and see the way they eliminate trouble.

Then, tell your supply man about it. When he knows that it is the belt you want, he will have it in stock all the time.

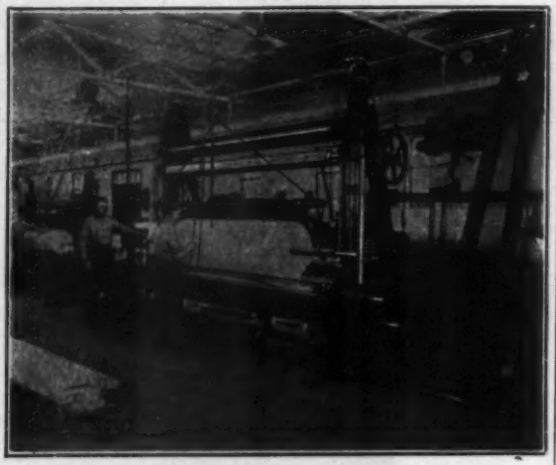
Your supply man, his stock and his service, are as necessary to the business prosperity of the community as your mill.

An understanding between you will not only save you time and money, but will help to bring business back to a point where everyone will get his share.

THE REPUBLIC RUBBER CO.
Youngstown, Ohio

Your Mill—Your Supply House
Your Community

TRADE
CAMACHINE
MARK
ROLL-WINDERS



Well Worth While—

is this recommendation of CAMACHINE-18 by Mr. Kindleberger:

"Our big winder that is just installed and now running is immensely satisfactory. We consider the buying of this big machine a wise and economical move. The boys running this winder wear a smile that won't come off—something that I have not seen in this mill for years. Parchment Paper is the hardest paper to run over the winder that there is, and this new winder seems to do the trick without any trouble.

"We just cannot help but feel very thankful to you for making a winder that will do the work so nicely.

"Sincerely yours,

"KALAMAZOO VEGETABLE PARCHMENT COMPANY,

"(Signed) J. KINDLEBERGER."

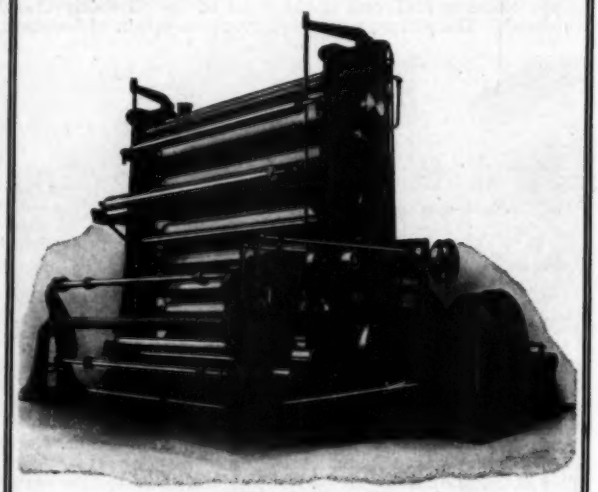
WORDS of praise and approval for work faithfully done are incentives to continued effort. Mr. Kindleberger knows this secret and is generous-minded enough to apply it. Any one of his phrases would make the ordinary testimonial—"immensely satisfactory," "a wise and economical move," "smile that won't come off," "without any trouble," and "feel very thankful to you."

The machine he bought is shown in the illustration above. It is CAMACHINE-18, the modern mill type winder. What it is doing in Mr. Kindleberger's mill it can do in yours. Will you allow us to figure on equipment to suit your particular needs? Your request will bring an immediate written or personal response from us.

CAMERON MACHINE COMPANY

61 POPLAR STREET BROOKLYN, NEW YORK

NORWOOD
SUPER CALENDERS

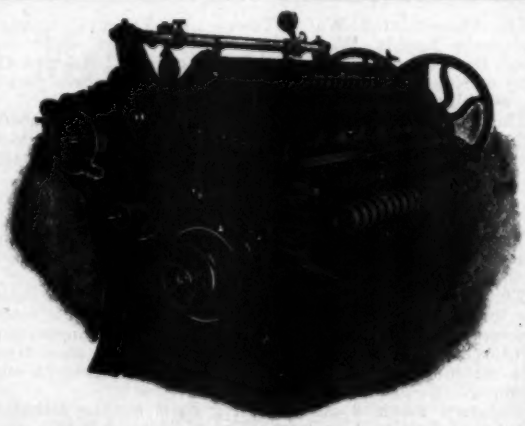


WE ARE SPECIALISTS IN

Paper Finishing Machinery

NORWOOD ENGINEERING CO.

FLORENCE, MASS., U. S. A.



PAPER CUTTERS

Single, Duplex, and Diagonal

CUTTER KNIVES

PATENT TOP SLITTERS

Hamblet Machine Co.

LAWRENCE, MASS.

The G. D. Jenssen Company are also erecting one of their Tower Acid Systems at the above mill. The towers of the new system are being located in the present acid building. This system will have an acid making capacity for 50 tons of sulphite, and will include a new cooler connected to the existing burner.

There are to be two charging sulphur towers, each 72 feet high and 7-foot diameter inside the lining. It is expected that this system will be placed in operation by January 1, 1925.

All of the construction work is being carried out by the company's forces and it is expected that the paper machine will be ready for operation by the last of this year.

George Burnside Killed

George W. Burnside, well-known paper man of Neenah, Wisconsin, was instantly killed when the auto which he was driving was struck by a North Western train on the College avenue crossing, Tuesday evening, September 23. Mr. Burnside apparently did not see the approaching train, his attention being attracted by an auto parade which was passing near the scene of the accident.

Mr. Burnside has been associated with the paper industry in Wisconsin for about thirty years and had many friends among the trade and mill men, who will regret to learn of his untimely death.

He was 58 years of age and as a young man was employed by the C. & N. W. Ry. Co. as a telegraph operator. Later, and for several years, he was connected with the Falls Mfg. Co., of Oconto Falls, Wis., and in 1901 moved to Neenah to take a position with the Geo. A. Whiting Paper Co. His next step was the starting of the Lakeside Paper Company, of which company he was general manager until 1919, at which time it was sold to the present owners. At the time of his death he was president of the Burnside Paper Company and general manager of the Valley Paper Mills, of Neenah.

Mr. Burnside was also very prominent in public life, being secretary of the Board of Education, secretary of the Police and Fire Commission and a director of the Neenah Club. He was a member of the Masonic fraternity and the funeral services were conducted by them.

Besides his wife, Mr. Burnside is survived by a sister, four daughters and two sons.

Fire at Mill of Dells Pulp and Paper Co.

Very early Friday morning, September 5, fire broke out in the "No. 8 Electric Pulp Mill" of the Dells Pulp and Paper Company of Eau Claire, Wisconsin.

The fire completely destroyed the inside of a building. The four steel roof trusses collapsed, and when these came down they brought down a small portion of the brick walls with them. All of the line shafting was twisted beyond repair, and all of the wooden guards and platform and belting were burned.

A 900 H.P. induction motor, driving two 3-pocket grinders, is a total loss, but the grinders were not hurt, neither were the screens and the concrete platform which they set on.

The mill is to be revamped at once by the regular construction crew. A new motor and roof trusses have been ordered, and work has already begun on this.

McBain Takes Vacation

Mr. B. T. McBain, former assistant general manager of the Nekoosa Edwards Paper Company, who resigned his position with that company on July 1st, left Port Edwards, Wisconsin, on the 19th of August on a motor trip to Portland, Oregon. Mrs. McBain and daughters, Bertelle and Jeannette, accompanied him on this trip.

The party arrived in Portland, Oregon, on September 16th after traveling 3,377 miles. During the trip stops were made at Madison, Wisconsin, five days at Ogden, Utah, and five days in Yellowstone Park.

It is understood that Mr. McBain will stay in Portland for a short time, and then will motor to California and will probably spend the winter near Merced in the San Joaquin Valley, where he owns a fig and almond ranch.

The hydroelectric plant which is located on the Prairie river at Grandfather Falls, Wisconsin, and which has been owned for a great many years by the Grandfather Falls Co., pulp and paper manufacturers, has been sold, together with the flowage rights, to the Electrical Equipment Company of Chicago. This new company will begin the operation of the plant sometime during next summer.

300 hp. Gas engine driven Alternator.
Engine pulley 114 in. diameter, 31 in. face.
Alternator pulley 27 in. diameter, 27 in. face.
Pulley centers 10 ft. 0 in.

THIS LENIX* DRIVE

1. Reduced the pulley centers from 41 feet to 10 feet.
2. Permitted the installation of another unit in the same building.
3. Saved the cost of extending the building in order to accommodate the new unit.
4. Eliminated belt slippage and increased the life of the belt.
5. Increased the capacity of the unit about 25 per cent.
6. Saved approximately 62 feet of double leather belt 22 inches wide.

Each one of these six items has a real money value. The saving in belting alone was more than sufficient to pay for the Lenix.

The general manager of the power plant in which this Lenix is installed wrote us the following letter:

"We were able to shorten our belt centers approximately 31 feet; this has meant a great saving to us in room and permitted room for an additional unit. The drive has also been very helpful by eliminating belt slippage and belt troubles generally and increasing the capacity of the unit about 25%. It has also increased the life of our belt and we are highly pleased with the operation of this drive from that standpoint as well as the saving of space."

The Lenix is not an idler. It is a "belt wrapper" scientifically applied to belt drives for the purpose of saving floor space, eliminating belt slippage and increasing the capacity of the drive.

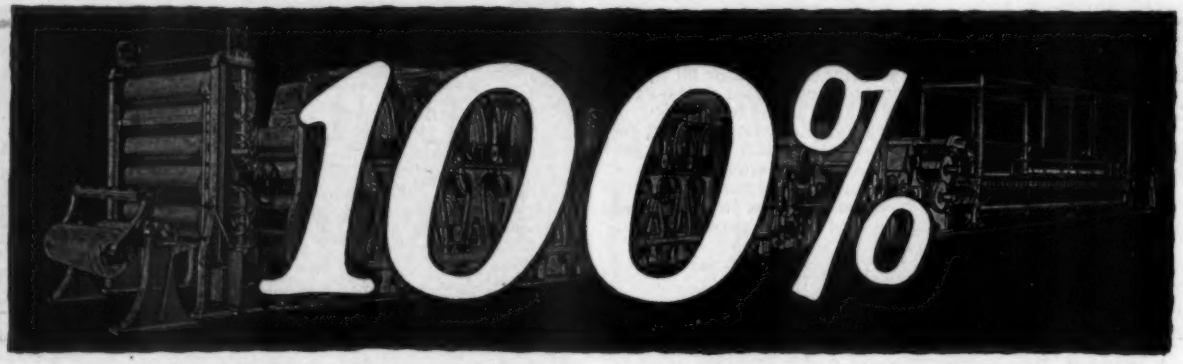
Send for Booklet "Saving Slippage and Space."

F. L. SMIDTH & CO.

ENGINEERS

50 Church St., New York, N. Y.

* Registered



To do its best work, a Fourdrinier Machine must be equipped with a long-wearing, smooth-running, Fourdrinier Wire.

How much paper the machine makes, its uniformity, its strength, and its texture, are all determined directly by the efficiency of the wire.

A wire that runs straight and true, that gives long service on the Fourdrinier Machine, speeds up the entire mill. You cannot approach 100% with an inferior wire—frequent shutdowns and inferior paper are the inevitable result.

A Tyler "Quality" Fourdrinier Wire is an investment in dependable performance and uniform paper. It assures a larger return in profit from your Fourdrinier Department.

Prove this yourself by putting a Tyler Wire on one of your machines. They are made in all widths up to and including 250".

THE W. S. TYLER COMPANY, *Cleveland, Ohio*

TYLER FOURDRINIER WIRES

CYLINDER WIRES BACKING WIRES WASHER WIRES CORDUROY WIRE CLOTH HUM-MER ELECTRIC SCREENS

Skinner Bros.

Baetz Patent HEATING SYSTEM

Skinner Heating Is Your Protection
It is foolish to expect favor from winter

The surest way to overcome winter is to prepare for it with reliable heating equipment, which means just such equipment that is constructed to perform with unfailing regularity at 40 below zero or 40 above. And to do its work better at less cost than any other was ever known to do. Skinner heaters give genuine satisfaction and perform with economy wherever used and are especially recommended for paper mills.

Skinner Heaters Eliminate Steam, Vapor and Excessive Moisture in Paper Mills

Skinner Heaters are individual compact units; they heat and ventilate and can be adapted to practically any type of air conditioning service; constructed in the floor type and the inverted type for overhead suspension. They are effective because of their simple, scientific construction. Heaters are particularly adapted for steam and vapor removal in paper mill machine and beater rooms. Their installation guarantees prevention and condensation of drippage and excessive moisture. No outside pipes or ducts are used for air distribution. Fan operated by any power available. Use live or exhaust steam at high or low pressure. They are portable and can be moved from one place to another. Completely assembled before shipment. Easy to install, most economical to operate and the maintenance cost is exceptionally low.

Skinner Heaters Are Used by These Well Known Mills

Crocker-Burbank Co., Certainteed Products Corp., International Paper Co., Mt. Vernon Strawboard Co., Terre Haute Paper Co., American Paper Products Co., Fairfield Paper Co., New York and Pennsylvania Co., Castanea Paper Co., Dresden Paper Co., J. Strange Paper Co., Auglaize Box Co., Adams Paper Co., Bulls Mfg. Co., United Paperboard Company—Installations in 12 branch mills.

Skinner Bros Baetz Patent Heater Steam Coil Type S. C. uses live or exhaust steam at high or low pressure. Where steam is not available we furnish Skinner Bros Patented Direct-Fired Type D. F., which burns coal, coke, wood, gas or oil.

Many hundreds of leading factories, of every type, in the United States and Canada, are users of Skinner Heaters, and they know what it means to heat best and cost less.

Skinner Bros Manufacturing Co., Inc.

Sole and exclusive manufacturers of Skinner Bros Baetz Patent Heaters and Skinner Bros Patented Direct Fired Heaters

Home Office and Factory, 1434 S. Vandeventer Ave., St. Louis, Mo.
Eastern Office and Factory, 116 Bayway, Elizabeth, N. J.
Sales Offices and Branches in all Principal Cities

Paper Manufacturer Hurt in Accident

Mr. Frank B. Whiting, vice president of the Whiting Plover Paper Company of Stevens Point, Wisconsin, and vice president and secretary of the Geo. A. Whiting Paper Company, of Menasha, was injured in an auto accident during the fore part of September when his big touring car was ditched at Devil's Bend on Wisconsin State Trunk Highway, west of Waverly Beach.

Pacific Coast News

October 1, 1924.

Chamber Comments on Paper Industry Purchases Paper Concern

The Journal of Commerce, Seattle, in its issue of September 12, comments on the local paper industry as follows:

Paper and board mills are beginning to receive orders for holiday business. Mills are now running to capacity and advance orders vary in volume from ten days running to several weeks.

The price level on paper shows a stiffening tendency. Advances have been made varying between five and ten percent. During the earlier part of the year the market reflected the general slowing down of business of this section. It is expected the volume for the remainder of the year will be satisfactory. Wrapping paper is firm in price.

A carload of paper, the first to be shipped by the Columbia River Paper Mills, left Vancouver, Wash., the week of September 13, consigned to J. H. Newbauer of San Francisco. The car, which consisted of Butcher Manila weighed 42,000 pounds. A second carload of Butcher Manila weighing 30,000 pounds, will be shipped to the Mutual Paper Company of Seattle, according to A .C. Watts, office manager of the Columbia River Paper Mills.

Two Paper Companies Consolidate

The Blake, McFall Paper Company and the Endicott Paper Company, both of Portland, Oregon, were recently consolidated and the two houses will be operated as a single corporation. The transaction involved the transfer of more than $600,000 worth of properties. Stocks of the Endicott company were removed to the Blake, McFall plant and the American Paper Company of Seattle, owned by the Blake, McFall company was consolidated with the Mutual Paper Company of the same city, and a property of the Endicott company. R. H. Miller, president of the Endicott Paper Company, will be in charge of the Seattle house.

The Blake, McFall Company, one of the oldest business institutions on the Pacific Coast, was organized in 1896, and was a successor of the Clackamas Paper Company, established in 1876.

A coal mine at Riverton, Oregon, has proved a snag to the disposal of corporate stock in the newly organized Alpine Paper Manufacturing Company, which plans to erect its factory at Coquille, Oregon. The mine is regarded as "dead wood" and the town, though anxious to add to the volume of its industries, refuses to support the project if the coal mine is to be listed in the assets of the company. F. E. Thompson and W. T. Alpine, president and secretary-treasurer, respectively, have been ordered by W. E. Crews, State Corporation Commissioner, to discontinue selling stock and to reimburse those who have already made purchases. The heads of the firm with C. L. Burton and D. Hill, promotors of the enterprise, have been in frequent conference with persons interested in the company, and with the assistance of a special committee appointed by the local chamber of commerce hope to revise their affairs so the project can go forward.

Machinery Arriving at Pacific Straw Mill

The Pacific Straw Paper and Board Company announce that their new paper factory on the Cowlitz river in Washington near Longview and Kelso is nearing completion. The plant has been designed to produce 30 tons of paper daily and consume 14,000 tons of straw annually. Twenty-four carloads of paper making machinery have begun to arrive from Middletown, Ohio, most of it via water from Baltimore, Maryland.

Officers of the company are Charles F. Schaub, president; G. A. Sweet, secretary-treasurer; and R. A. Clayton, manager. Only one other strawpaper mill operates on the Pacific Coast and the market for the product is reported strong.

The Chester-Fisher Logging Company has finished its contract to log off a tract of timber in the Lewis and Clark river district in northwestern Oregon for the Crown-Willamette

Belts with Powerful Pull

THE belt pictured below is a 20″ double. Its wonderful Tannate grip greatly pleases its owners. Before it was installed two successive 20″ Oak belts on this drive showed maximum capacity of only 166 H. P. Both these belts were three ply. This Rhoads Belt, though only a double, delivers 275 H. P. at 2667 R. P. M., a heavy overload, a result due to the wonderful tractive grip of

Rhoads Tannate Belting

Its grip and strength particularly adapt Tannate to severe drives. Its strength and pliability give it long life. It is not merely a hard-service belt but is economical for the average drive.

USE RHOADS LEATHER BELT PRESERVER ON ALL LEATHER BELTS. IT MAKES THEM PULL STRONGER AND LAST LONGER

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Cuts a printed roll to accurate register with the print.
A machine for long run sheet cutting.
Length of cut can be varied by ¼".
Built in sizes to meet requirements.
Fastest machine on the market.

QUALITY SPEED DURABILITY MEISEL
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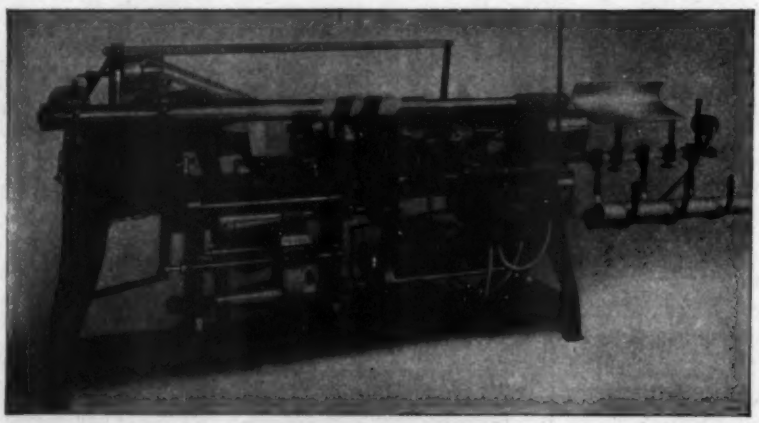
Cores for Toilet Paper Made at Lower Cost



CORES for Toilet Paper made on the Knowlton Spiral Tube Winder cost less and are stronger than the lap tube.

The process of making such tubes is continuous, requiring a smaller pay roll for a larger volume of cores.

The machine can be used also for manufacturing Mailing Tubes, and all kinds of Paper Cans. Write for particulars.

If you wish to cut Paper Tube Costs, write us about the

KNOWLTON SPIRAL TUBE WINDER

M. D. KNOWLTON COMPANY, Rochester, N. Y., U. S. A.

New York—203-205 Wooster St. Chicago—856 W. Adams St., cor. Peoria St.
London E. C., Eng.—23 Goswell Road Cable Address, "Stayer, Rochester," A. B. C. Code

Paper Company, and has started cutting in a new tract comprising 125,000,000 feet of timber on the north fork of the Klatskanine river.

Construction Starts on New Mill

Construction of a big wood pulp and paper mill is expected to be begun immediately at Tumwater, near Olympia, Wash., following articles of incorporation filed with the secretary of state by the West Coast Pulp and Paper Company which is capitalized at $1,250,000. John McNary, H. S. Giles and William H. Trindle, all of Salem, Oregon, were in Olympia in connection with the filing of the articles. A large brewery will be used by the new company. "Present bui dings of the brewery could not be better arranged or adapted if they were to be constructed anew," Trindle said. "The brewery property will be turned into the company for what it is worth to the industry." Local sawmills will furnish "hog feed" at reasonable prices.

The Columbia River Paper Mills Company of Vancouver, Washington, announces that lumber shipments of its mill in mid-September totaled 1,550,000 feet, and local lumber officials express the belief that the lumber market, which has been in a poor condition for some time, is beginning to show improvement.

The Crown-Willamette Paper Company will add another unit to its plant at West Linn, Oregon, and J. C. Tildsley, construction superintendent of the Charles C. Moore Construction Company, has already arrived on the site to line out the work.

A New Refining or Brushing Engine

WE HAD the pleasure of seeing a new pulp refining engine in action in the A. P. W. Paper Company's paper mill in Albany recently. This new machine is being manufactured by The Bauer Bros. Company of Springfield, Ohio, both the machine and the process being fully protected by patents and patent applications.

The machine is radically different from present-day beaters or Jordans, and is constructed of two vertical disc plates set in a suitable housing. The pulp is fed through a chute on the side of the machine and enters through the center of one of the discs. The opposite disc has a hollow in the center, and from here the pulp is forced outwardly by centrifugal force of the discs moving in opposite directions. An interesting feature in design is the motor mounting. Two motors of 50 to 75 horsepower each are mounted directly on the machine, the machine shafts carrying the rotors of the motors. This mounting is declared by motor manufacturers to the most efficient direct connected application of motors yet designed.

The two discs are covered with plates of "Clewa" metal, the faces of which have bars with the alternate space about one-eighth inch deeper than the bars.

The fibers are rubbed between these plates, as they move outwardly, and are crushed and brushed. The machine does not however, shorten or cut the fibers.

An interesting feature of this machine is that the fibers are rolled and torn apart, rather than cut, hence the production is a long-fibered stock which is naturally desirable.

In the A. P. W. mill, the machine works between the beater and Jordan, and lessens considerably the necessary time for the stock to be in the beaters. As high as thirteen tons are made on one of the paper machines in this mill, the stock of which goes through this machine, but inasmuch as some of the stock from the overflow passes through the machine twice, it will be noted that it has a very large capacity. The stock going through this machine at the present time is ground wood and sulphite pulps. Stock of a consistency of 10 per cent or more can be fed to the machine, thereby getting a larger output and saving considerable in power, most of which is now used up in handling large volumes of water.

The machine runs at 1,200 R.P.M. and all bearings are ball bearings, so the power consumed is comparatively small, and, as the stock runs between the two discs having a speed differential of over four miles a minute, the volume must necessarily be great.

The only wearing parts of the machine are the "Clewa" metal plates, which are inexpensive and can be completely changed in less than two hours. This machine requires a small amount of floor space.

It is stated that the pop test has been increased considerably where this machine is used.

Work on new mill offices of the Abitibi Power and Paper Co., Ltd., at Iroquois Falls, Ont., is nearing completion.

One of two C-H 66-inch Magnetic Clutches on magazine pulp grinder drive, Northern Paper Co.

C-H Magnetic Clutches are simple, rugged clutches requiring but small space and are easily thrown in or out of engagement. There are no links, levers, or toggles, the mere pushing of a button or operation of a switch being all that is necessary to control engagement and disengagement.

Magnetic clutches permit the use of power-factor-raising synchronous motors on constant speed drives where the required starting torque is higher than can be developed by the motor. These motors are brought up to speed with clutch disengaged, after which the load is picked up without the jarring grab of a jaw clutch.

The Standard Clutch for Paper Mill Drives

The rapidly growing use of Cutler-Hammer Magnetic Clutches in the paper industry is indicated by the many applications listed below:

ON FOURDRINIER PAPER MACHINES

Thilmany Pulp & Paper Co., Kaukauna, Wis..... 12 clutches
Chester Paper Co., Chester, Pa..... 3 clutches
The Frank Smith Paper Co., Middletown, Ohio..... 7 clutches

ON YANKEE PAPER MACHINES

Thilmany Pulp & Paper Co., Kaukauna, Wis..... 4 clutches
Paper Converting Co., Niagara Falls, N. Y..... 3 clutches

ON PULP GRINDER

Northern Paper Mills, Green Bay, Wis..... 2 clutches

ON BEATERS AND JORDAN ENGINES

Flambeau Paper Co., Park Falls, Wis..... 1 clutch
W. B. Oglesby Paper Co., Middletown, Ohio..... 1 clutch

ON PAPER REELS

Paper Converting Co., Niagara Falls, N. Y..... 4 clutches

SPECIAL SYNCHRONOUS MOTOR DRIVES

Hummel Ross Paper Co., Petersburg, Va..... 1 clutch

ON LINE SHAFT DRIVES

Neenah Paper Co., Neenah, Wis..... 1 clutch
Bryant Paper Co., Kalamazoo, Mich..... 1 clutch
Standard Paper Co., Kalamazoo, Mich..... 1 clutch
Fairfield Paper Co., Baltimore, Ohio..... 1 clutch

You can take advantage of power-factor-raising synchronous motors on many drives, through the use of C-H Magnetic Clutches. Let us give you complete information. Booklet 2030 will be mailed on request.

THE CUTLER-HAMMER MFG. CO.

Magnet and Clutch Department

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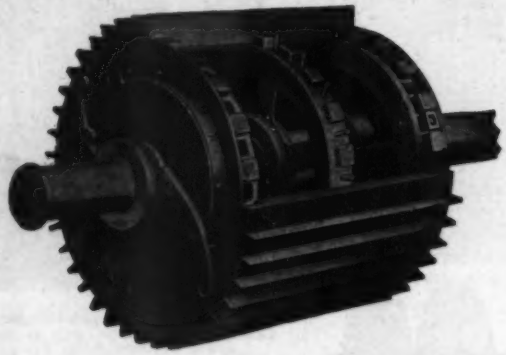
C-H MAGNETIC CLUTCHES



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Absolutely balanced; will not pound out of shape

Specify these when ordering new pumps.

Order these to replace worn-out balls.

We make a specialty of repairing stuff pump balls.

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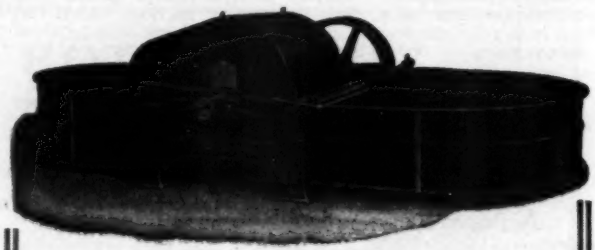
Every ball bears our registered trade-mark



"Dayton" Beating Engines are Built for Heavy Duty

Dayton Beater and Hoist Co.

DAYTON, OHIO

FALLS SOLID FRICTION CLUTCH PULLEY

A complete line of

Power Transmission Machinery

FOR

BELT AND ROPE DRIVES

MANUFACTURED BY

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NEW YORK 326-328 Fulton Street

Cuyahoga Falls, Ohio

Catalogues upon request

BOSTON 52 Purchase Street

New Mill of Frank Smith Paper Co.

(*Continued from page 1229*)

centrifugal, deep well pumps of 2,000 gallons' capacity each. These pumps discharge into a concrete weir box with which the delivery of the pumps can be checked at any time and from this weir box into a cistern about 14x40 feet under the machine room floor. Water is supplied to the machine, beater room and bleach plants with enclosed impellor centrifugal pumps driven by direct connected motors and fitted with special impellors designed for the flattest possible head-capacity performance to minimize pressure variation with variation in demand. The centrifugal pumps for the Smith mill and the extension of the Oglesby mill were mainly supplied by The Union Steam Pump Co., the special pumps for delivering the bleach liquor by the Hayton Pump and Blower Co.

The architectural design of the mill was made and construction superintended by Albert Pretzinger and E. P. Mussellman, of Dayton, with B. M. Baxter and Co., of Grand Rapids, Mich., consulting engineers, in advisory capacity.

Oglesby Mill Altered to Meet Related Requirements

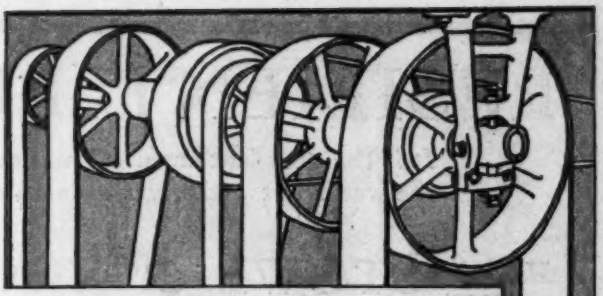
Extensive additions and alterations have been made in the W. B. Oglesby mill and are related to the requirements in the Smith mill. Included in these is the construction of a bleach-making plant having capacity required to bleach 100 tons of sulphite pulp daily, mainly for the Smith mill. This plant is designed for the use of liquid chlorine, using the Electro Bleaching Gas absorption tower system. This equipment includes one 12,000-gallon mixing tank, with two 30-inch absorption towers, six 12,000-gallon steel settling tanks, fitted with agitators, and six vertical cast iron clear bleach storage tanks placed in a basement directly under the settling tanks. The design of this plant follows closely that of a plant designed in 1915 by B. M. Baxter for the Sorg Paper Co. and has proved very satisfactory.

Power and steam requirements in the Smith mill were the occasion for considerable alterations in the power equipment in the Oglesby mill. It is probable that later a central power plant will be built to serve all three mills. For the present, the steam requirements of the Smith mill will be provided by the Oglesby boiler plant. To avoid undue load on this plant or the installation of new equipment in it, a tandem compound engine driving the beater room and a power generator will be shut down. A 52-pole, Crocker-Wheeler motor has been installed for direct connection to the end of the beater line shaft through a 60-inch Cutler-Hammer magnetic clutch. This motor is rated at 500 H.P.—0.8 power factor, 40° rise, 138 R.P.M. At unity power factor, and 50° rise, this motor will develop 750 H.P. The large overload capacity is provided to take care of occasional withdrawal from service of water power amounting to about 240 H.P. used on the beater line shaft, although the motor is capable of picking up the water power load without exceeding the normal temperature rating. A 250 K.W., direct current, three bearing, belted generator formerly driven by the compound engine has been converted into a motor-generator set by mounting a special, Electric Machinery Mfg. Co., synchronous motor on the shaft of the generator in place of the pulley, a split rotor being furnished for this purpose.

It is expected that the direct current motors in the Oglesby mill will gradually be replaced by alternating current motors, accordingly the synchronous motor was selected of suitable speed for later direct connection to a Jordan, the reduced speed of the generator being taken care of by paralleling the fields and introduction of suitable resistance in the field circuit. A new switchboard, furnished by the Post-Grover Electric Company, has been installed in the machine room. Push button control for the 500 H.P. motor with a special relay to prevent engaging the clutch until the motor is on the line was furnished by the Allan Bradley Mfg. Co. with automatic relay for closing the field circuit.

Upon careful checking of the tube surface and with provision for steam lines through the tube bank, a Wheeler Admiralty surface condenser in use with the compound engine was found suitable for the turbine unit. The direct acting steam pumps were discarded, a new motor driven centrifugal circulating pump and a Wheeler-Edwards wet air pump purchased. With the better auxiliaries and adaptation of the tube arrangement to modern practice, the performance of the condenser is ample for the new work. The synchronous motor capacity installed is ample to maintain the power factor of the central station, when built, at or near unity with an estimated load in the three mills of about 4,000 K.W. If this plant is not built, the provision for a high power factor will insure minimum power rates.

An enlargement of capacity for cooking special grades of



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One belt isn't a great expense. But after three or four accidents to it, with production shut-downs, it has cost real money.

A replacement is probably needed years before it ought to be.

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Belt care has stopped surprisingly big leaks and has jacked up output in paper mills—*we've tried it.*

WATERPROOF LEATHER BELTS transmit more power under wet working conditions than substitutes—rubber has an extremely low frictional value when wet.

They have a longer life and a higher salvage value than any substitute.

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The Stickle system of removing air and condensation from the dryers, combined with the Stickle automatic control of steam, will produce a more uniform dried sheet with less steam consumed than can be done with any other equipment. We will guarantee this under a competitive test.

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New Sand Filter

A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

Send for full particulars

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SKANEATELES FALLS

New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

paper stock has also been made by installing a 14-foot Biggs globe rotary digester, three Dayton high speed type paper washers, dumping into chests fitted with agitators driven by individual motors through Bevis and Shartle planetary speed reducers. This equipment also includes two ten-plate Harmon flat screens and one 48x120 Woods pulp thickener furnished by the Glens Falls Machine Works. The thick stock from the thickener will be spouted into the present slushing system. The motor equipment for this department and for the bleach making plant is Allis-Chalmers, all motors furnished with ball bearings except the three large slow-speed motors driving the washers.

The architectural design of the addition to the Oglesby mill, which also includes the large storage space, was by Thos. Scott and Son, of Middletown, with the co-operation of B. M. Baxter and Co. on adaptation to mill requirements. All engineering of the mechanical equipment, heating and ventilating and water supply of both mills was handled by B. M. Baxter and Co., of Grand Rapids, Mich., with the supervision of the installation by Mr. B. C. Hope, of B. M. Baxter and Co.

Improved Facilities for Handling Pulpwood

According to word received from the Quebec, Montreal and Southern Counties Railway Company, considerable improvement has been made in the facilities for handling pulpwood at Sorel, Quebec. The company has constructed a new wharf; the river has been dredged to accommodate the largest freight carriers on the St. Lawrence River, and additional machinery has been installed to expedite pulpwood handling.

Their pulpwood handlings this year to August 1st, as compared with last year, are as follows: Boats handled in 1923, 15; in 1924, 17; pulpwood unloaded and shipped out, 2,880 cords in 1923, 4,250 cords in 1924; pulpwood stored for future shipment 45½ cords in 1923, 258 cords in 1924.

The company expects to be reasonably busy for the rest of the season, as they have been receiving many inquiries, and if the majority of expressed intentions materialize the quantity of pulpwood handled should be as large as last year, 23,380 cords. They are contemplating improving their facilities still further as additional traffic may warrant.

Site of Gulf Mill

A report is current that the Gulf Pulp and Paper Company, of which Frank Clarke is the head, and which is bound by a contract with the Quebec Government to erect a paper mill within a distance of eight miles from one of the cities in the Province of Quebec, will likely choose Quebec City.

Sillery had first been mentioned as the most likely site for this purpose; and if reports are accurate the south shore in front of that municipality will benefit from the provisions made by the Government.

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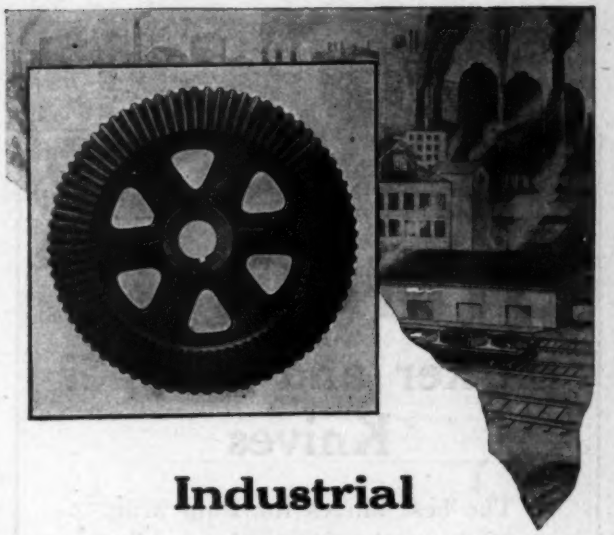

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Each gear is marked for easy re-order and bears the date of manufacture so that you can check its period of usefulness against others.

Ganschow facilities are unlimited and Ganschow service is prompt. Give us an opportun tiy to quote on your requirements.

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The best knives for Pulp Mills. Made of the finest edge-holding steel, skillfully made and tempered right to withstand wear.

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1. *Surface remaining true much longer*
2. *Greater speed to your machines*
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Write Dept. C 10, B. F. PERKINS & SON, Inc., Holyoke, Mass.

SOLE MANUFACTURERS

PERKINS GRANITE PRESS ROLLS

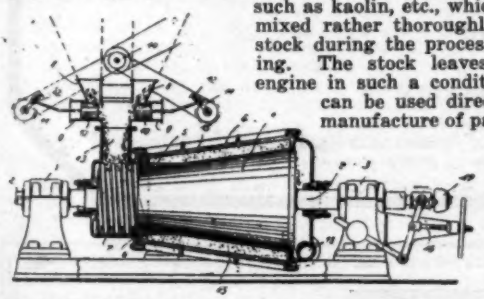
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Stuff Engine for Preparing Wood Pulp

THE new process and apparatus, which are described in German Patent No. 389265 consist essentially in the following; the wood is cominuted so as to bring it into a condition where it can be easily handled and transported from place to place; then, it is subjected to a partial chemical digestion and thereafter it is fed into a stuff engine or beater in order to work up mechanically the remaining constituents of the wood. In this manner there is obtained the desired admixture of mechanical wood pulp and chemical wood. Inasmuch as, just before the mechanical "digestion" is carried out, the requisite additional materials are added to the pulp, such as kaolin, etc., which are then mixed rather thoroughly with the stock during the process of grinding. The stock leaves the stuff engine in such a condition that it can be used directly in the manufacture of paper on the paper making machine.



A ball mill, which is used for carrying, put the most important step in the process, is shown in the accompanying illustration.

The ball mill is shown at 1. It rotates on the shaft (2) in the bearings (3). The mill is provided with a jacket (4), which at the smaller end of the mill is either cylindrical in form or less conical in shape than the mill itself, so that a wedge-shaped portion seen at (5) is formed. A housing (6) is connected with this part into which the screw conveyor (7) is built. This device can be connected with the shaft of the mill or it may be driven on a separate shaft. The stone jacket (4), which can be made in single or in several parts, runs parallel or almost parallel in its lower part, as far as the inside surface is concerned, to the jacket of the mill.

A loading arrangement is located over the screw conveyor. This arrangement consists of several containers (8), under which there are located cylinders (9) in which the pistons (10) are driven by the cranks (11). The purpose of this arrangement is to feed a certain amount of material regularly to the screw conveyor.

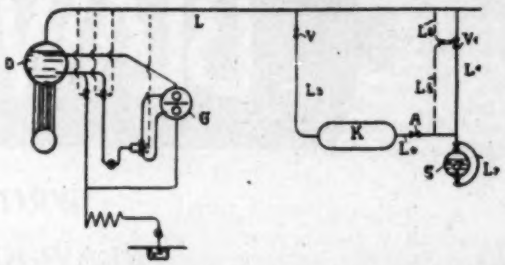
The grinding or beating of the mass of stock takes place in the annular space (5). The stock, due to centrifugal force and the pressure of the screw conveyor tends to move towards the narrower end of the annular ring (5). In this manner the smaller pieces overtake the larger pieces until they again come in contact with the beating surfaces and are ground up. This makes the movement of the particles within the mill automatic in character so that the grinding is regulated as well as the pressure that is applied to the particles of stock within the mill. The net result is that the product obtained is very uniform in character.

White Sulphite Cellulose from Resinous Wood

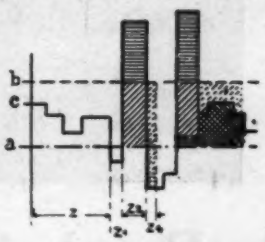
UNITED States Patent No. 1,507,559 is concerned with a process for the manufacture of white sulphite cellulose from resinous wood, such as fir and the like. For digesting the wood a lye is prepared which contains in solution calcium bisulphite, a sodium salt and free sulphurous acid. The digestion of the wood in this liquor is carried out at a pressure of approximately 5 to 6 atmospheres and at a final temperature of about 130 to 150 degrees C.

Use of Pressure Equalizing Vessel in Digester Operation

IN THE accompanying illustration, D is a steam boiler and G is a pressure equalizing vessel which is inserted in the installation for the purpose of smoothing out the peak loads that are placed upon the apparatus. A large water tank (S) is connected to the steam line (L) which runs from the boiler (D). The connection is made through the line (L_3). The large water tank is used as a steam storage apparatus during the time that the load on the boiler is small. The charging of



the steam into this water storage tank is accomplished through the line (L_2). Then again in the case where the demand of steam is greatly increased, the steam that has been stored in this apparatus is discharged and fed to the digester in part through the line (L_1) and in part through the line (L_4). The digester is seen at K. The line leading to the digester from the main steam line (L) is furnished with an automatic pressure valve V (seen on the line L_2). The feeding of steam into the digester K from the storage tank S is accomplished through the lines (L_5) and (L_4) and the valve (A). Then again in the line (L_3) there is placed an automatic double acting pressure valve (V_1), which on the one hand is influenced by the pressure in the steam accumulator (S) through a branch line (L_6) connected to the line (L_4), so that the pressure within the steam accumulator (S) is maintained constant, and on the other hand it is actuated by the steam pressure in the main steam line (L) through a by-pass (L_7), and in this way serves to keep the steam pressure within the boiler at a constant point.



The effect that is produced in the operation of digester by such a system is seen from the diagram, indicating the location of peak loads. The dot and dash line (a) represents the average production of steam in the boiler, the dotted line (b) the maximum steam production with auxiliary feed of stored steam from the steam accumulator (S), while the full line (c) indicates the variation in the steam demand from time to time.

According to this illustration, steam production sets in after, for example, the steam consumption during the time (Z) has been greater than the production, except for the small period of time (Z_1) during which the steam consumption falls below the steam production. During the period (Z_2) large quantities of steam are required which must be obtained from the steam accumulator, in accordance with the systems that have been used heretofore. But in accordance with the present invention, the valve (V_1) serves to regulate the pressure within the acumulator (S) at a constant point, and it opens when the pressure within this apparatus is reduced and a certain amount of steam is drawn from the steam boiler (D) to compensate for the drop in pressure. In the time interval (Z_3) the cross-hatched section represents the amount of steam brought into the accumulator, while the section lying directly overhead and hatched with horizontal lines represents the quantity of steam that is taken out of the accumulator.

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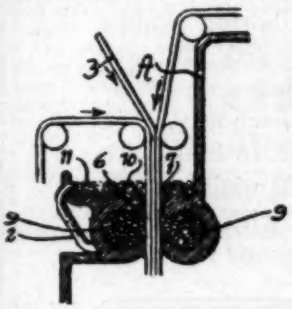
Now if the evaporation or steaming is stopped and steam for digestion is fed to the digester through the line (L_0), then the pressure limiting valve operates in such a manner that the accumulator, the pressure in which has naturally dropped, due to the removal of steam from it, is again charged with steam. The boiler load may be quite reduced in this period of time which is shown in the diagram as (Z_0). German Patent No. 399,876.

Drying Paper in a Vacuum Drying Chamber

THE apparatus which is patented in German Patent No. 399,785 is concerned with an arrangement for drying paper in a drying chamber from which the air has been partly exhausted. The drying chamber is provided with liquid lutes that seal the chamber. The paper sheet is shown at (3), the travel of which is in the direction of the arrow as shown in the diagram. The liquid which closed the entrance to the drying chamber is moved about within the closure and flows through the narrowest part (6) of the nozzle (7), which gradually widens on the outside. The speed of the flow of liquid, after it has passed the narrowest part, is reduced in the gradually widening nozzle, but it must be just large enough to exert a certain amount of pressure which is equal to that of the atmosphere.



In the closure there are arranged two rotating pumps which are seen at (9). These pumps drive the liquor into the narrowest part of the passage. In order to consume as little energy as possible in this operation, the pumps are run at a speed that is sufficient to give the liquor a pressure equal to that of the atmosphere.

Testing Bleached Wood Pulp

THE microscopical measurement of average length and breadth of the fibers is the first important test. This may be supplemented by a comparative visual examination of dilute suspensions of pulp in a tray having a blue glass bottom with an electric lamp and condenser lens fixed underneath. Measurements of hydration capacity are made of the sedimentation tester. Sheets of paper should be made under standard conditions on a hand mold after beating for a given time in a small ball mill, and the strength of the paper tested.

Various methods for testing and recording the cleanliness of the pulp are also discussed in this paper. The sheet of pulp may be examined by transmitted light and the number of specks counted. A maximum of 300 specks per pound of pulp is suggested as a standard for the manufacture of writing papers. Specks of iron and copper may be made visible as ferrocyanides after oxidation with 10 percent of nitric acid. Useful results are obtained by systematic analysis and classification of the specks, determining the percentages of the various kinds, copper, iron, splinters, bark residues, resin specks, calcium salts, and sand. Sometimes lead is present in the form of black peroxide. Calcium sulphate and lead compounds can be identified microscopically by the crystalline form of the evaporated residue after treatment with hydrochloric acid. An analysis at different stages before and after bleaching will afford an indication as to which section of the mill is contributing certain types of contamination. Standard plates for the estimation of color may be prepared from mixtures of plaster of Paris, potassium bichromate, and calcined magnesia in known proportions. For further details, see Zellstoff und Papier, volume 4, 1924, pages 85-88.

Sulphite Wood Pulp Digestion Process

THE composition of the dry substance of spruce wood averaged 28 to 29 per cent of lignin, 49 to 50 per cent of cellulose, 10 per cent of pentosans, about 10 per cent of fermentable sugars and from one to one and one-half per cent of resin, ash and protein. Working by indirect digestion process the average yield of a fairly strong quality of sulphite pulp is from 50 to 52 per cent. The slight variations above and below this value are caused by variations in the density of the wood. In the preparation of a still stronger type of pulp the yield, which is calculated on the dry substance, rises to 54 to 56 per cent. The product is in no case pure cellulose, the average composition of the fairly strong pulp being lignin 5 per cent, pentosan 3.2 per cent, fermentable sugar 1.5 per cent, resin 1 per cent, ash 0.7 per cent and cellulose 89 per cent, calculated on the dry substance. This corresponds with a loss of true cellulose during digestion of about 8.5 per cent.

The corresponding values for the stronger types of pulp are residual lignin 7 per cent, and calculated loss of cellulose during digestion 6.5 per cent.

In the manufacture of "easy bleaching" types, the yield of pulp falls from 46 to 47 percent, or even lower. These pulps contain only from one to two percent of residual lignin and from 2.6 to three percent of pentosans; the cellulose is from 94 to 95 percent pure, whence is calculated a loss of cellulose during the digestion process equivalent to eleven to twelve percent.

All of the above figures are expresed in terms of dry substance and of crude pulp as it comes from the digester. In further manufacture there are losses averaging one percent in the form of splinters, three percent in the knot catchers, and sand traps, and from one and one-half to two percent loss of fiber, giving in the case of the "strong" variety of pulp a net yield of 48.5 percent dry weight or 53.5 to 54 percent of air dry pulp, and for the easy bleaching variety 44 to 45 percent of dry or 49.5 percent of the air dry pulp.

It is calculated that one ton of air dry "strong" pulp on this basis would require 4.5 cubic meters of dressed wood with thirty to forty percent of moisture, and one ton of air dry "easy bleaching" pulp would require five cubic meters of dressed wood. Per cubic meter of digester capacity more pulp can be obtained with moist wood than with dry wood because it packs more closely, for instance wood with twenty-five percent of moisture yielded from 83 to 86 kilograms of air dry pulp per cubic meter of digester volume, whereas wood containing 40 to 42 percent of moisture yielded 89 to 90 kilograms.

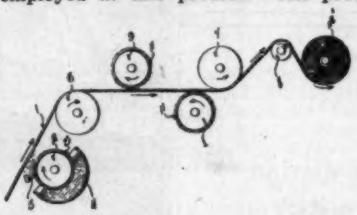
For further details on this important article see Papierfabrikant, 1924, pages 241 to 246.

Latex Paper

A NEW British patent has been granted F. Kaye on latex paper. The process is concerned with making fibrous plastic compositions. Fibrous material of animal, vegetable or mineral origin, with or without filling substances such as china clay, is converted into pulp and treated with rubber latex or similar substances. The treatment takes place in the beater. Coagulation of the rubber may be accomplished in the ordinary manner. Powdered sulphur or soluble sulphur compounds, such as alkali sulphides, and accelerators may be added either to the latex or at a later stage. The treated pulp may be drained and molded directly, but, preferably it is sheeted without complete drying on a paper board machine under pressure, with or without the addition of fibers, waste rubber or mineral fillers. The product may be vulcanized.

Teasling Paper

UNITED States Patent No. 1,508,087 is concerned with a process for the manufacture of a teasled paper. The illustration shows in diagrammatic form the apparatus that is employed in this process. The process consists essentially of supplying the web of paper with a predetermined amount of moisture and then producing a fuzz on the paper after it has been moistened by striking a large number of spaced points along its surface.



Recovering Alkali from Waste Liquor

A BRITISH Patent has been applied for by the inventor of the Rinman process for the recovery of alkali from waste liquors. The details are described as follows:

The dry distillation of evaporated waste alkali liquor from the manufacture of pulp is carried out only until the more valuable organic products that it contains, such as acetone, alcohol and methyl ethyl ketone, are recovered. The temperature at which this distillation takes place is 400 degrees C. Then the remaining solid material is preferably cooled in a still or apparatus in which the evaporation takes place to about 250 to 300 degrees C. This is done by spraying water into the retort. The cooled material is then removed from the retort and crushed or granulated. The granulated product is burned in a rotary furnace at a temperature of 750 degrees C, or the pulverized product is burned as powdered fuel with preheated air at a temperature of 1,000 to 1,200 degrees C. In the former case a part and in the latter case the whole of the lime contained in the residue becomes caustic. When

Twelve Spindle Boring Machine
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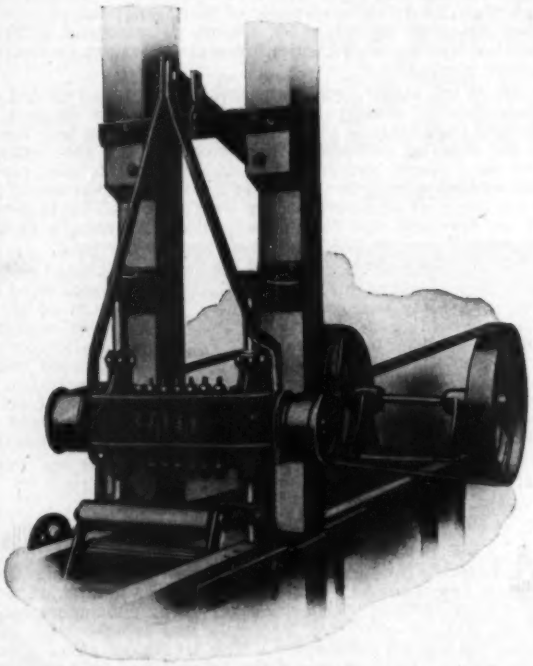

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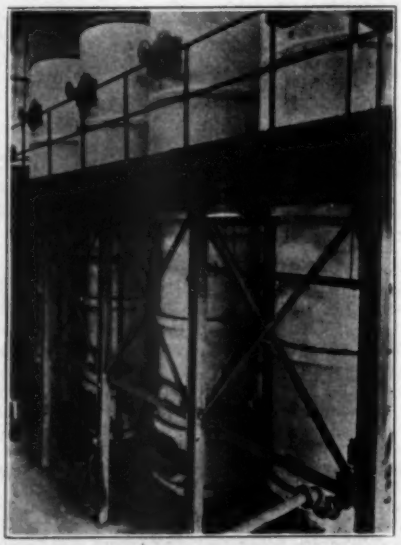

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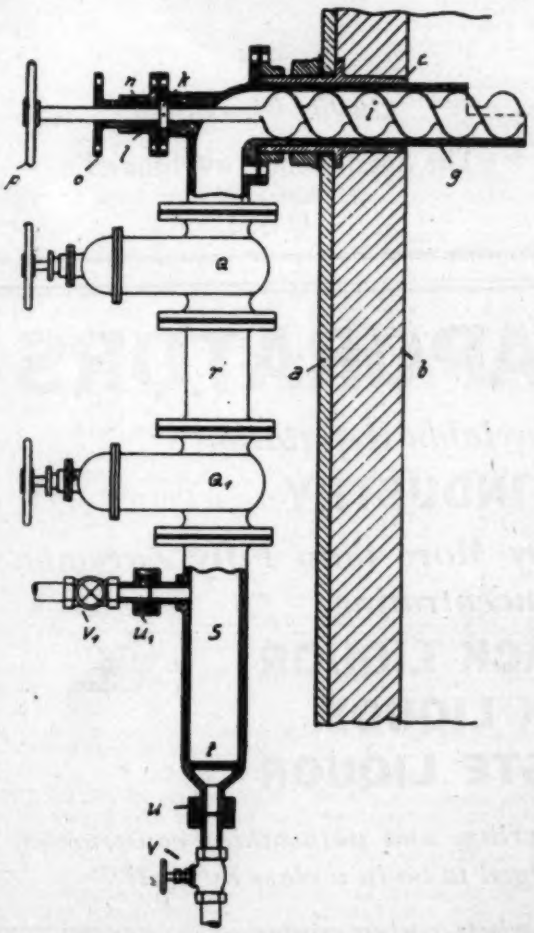
the gases produced in the burning of the residue are free from sulphur, they may be used for preheating to 300 degrees C the lime sludge that is produced during the preparation of caustic soda lye from the burned residues. The dried preheated calcium carbonate which is obtained in this manner may then be burned with ordinary fuel to obtain lime.

Use of Common Fir Wood in Paper Making

ALTHOUGH the wood of the common fir is very similar to that of the spruce, it finds at present little application in the manufacture of wood pulp and cellulose, chiefly because its fibers are coarser than those of spruce wood. In winter, however, the fibers are shorter and finer than in the summer, though having thicker walls, and, in any case, are much finer than those of the Scotch pine. Fir wood has a yellow color, is practically free from rosin, and, for a fairly great height, from knots, and the pulp produced from it has a much more constant color than that produced from spruce wood, and is very suitable, after removal of the coarser fibers, for soda pulp or for steamed mechanical pulp for leather board. The power consumption and cost of working fir wood are approximately the same as for spruce wood. Chemiker Zeitung, 1924, 279-280.

Sample Taker on Digester

IN THE ordinary arrangements that are commonly provided in the walls of the digester for taking samples of the stock during the course of its treatment in the apparatus, the devices are so constructed that danger is always present of the digestion liquor gumming up the valves or cocks so that when they are once opened it is very difficult to close them again tightly, and, in most cases, they do not close tightly, with the result that it is impossible to maintain the proper pressure within the digester or cooker.



The device which is patented in German patent No. 394,679 is intended to do away with these difficulties. To this end, a special box is built into the wall of the digester, and in this casing there is located a small screw conveyor which takes a certain quantity of the contents of the digester as a sample and delivers it to the sample-taking device.

In the illustration (a) is the wall of the digester or cooker, which is provided with an acid-proof lining (b). The casing (c) is built into the wall of the digester and the screw conveyor casing (g) is fastened into the casing (c) by means of the flange (f). The screw conveying device is built into the casing (g) and is fastened by means of the ring (k). Various bushings and parts which enable the operator to manipulate the screw and take a sample out of the digester while maintaining tight connections are seen in the figure. The hand wheel (p) is used to turn the screw. Q and Q_1 are an arrangement of valves which permits the removal of the sample of digester contents without any interruption in the course of the digestion reaction and without disturbing the pressure conditions that exist in it.

A preliminary determination is made of the number of turns of the hand wheel that will be required to obtain a certain amount of sample of the contents of the digester; in taking the sample it is possible therefore by turning the handwheel (p) the requisite number of turns to obtain in all cases the same amount of sample or in fact any amount of sample that may be desired. The screw (i) takes the sample out of the digester. The sample falls down through the vertical pipe (r) and fills the same above the valve (Q_1). When enough of the contents of the digester has been sampled, the valve (Q) is closed, and the remainder of the material drawn from the digester may easily be returned to it again by turning the handwheel (p) in the opposite direction. Then the valve (Q_1) may be opened and the sample drops into the chamber (s), from which it can be easily removed. The valve (Q_1) is then closed. This apparatus is patented in German patent No. 394,679.

Paper from Peat

THE invention, which is patented in British patent No. 207,377, is concerned with a process for making paper from peat. The process relates in particular to the direct recovery of cellulosic materials, which are suitable for the manufacture of paper, from raw peat or the like. The process is based on a novel observation that fresh cut peat which is, if necessary, previously treated in a disintegrating machine, gives a cellulosic material on boiling with milk of lime, on addition of sodium sulphate, sodium sulphite or sodium carbonate, or other substances yielding these by reaction, and this cellulosic material can be used after bleaching and neutralization for the production of cardboard.

If the material that is obtained in this manner is subjected to the usual sulphite or alkali process, a substantially pure paper cellulose is obtained. If the first boiling is carried out in the presence of large quantities of milk of lime and under increased pressure in autocalves, splendid material is obtained in one operation, which, preferably, after bleaching, may be used for the production of newsprint.

In addition to peat, it is possible to treat like materials, namely, crude cellulosic materials such as plant fibers, sawdust, straw, jute, maize, or artichoke fibers, esparto and other materials, which can be treated by boiling with caustic soda. It was not known that it was possible to obtain a light colored, good quality, paper material from dark brown peat through a simple process of boiling with soda, but this method is not a commercial one because of the expense involved in the use of soda. Moreover, with ordinary boiling, cellulose, which is suitable for the production of newsprint, cannot be obtained, presence a great part of the humic acid and humic constituents present in the peat persist in the cellulose, and though these can be bleached they absorb chlorine and, consequently, cause weakness in the paper produced.

If, however, milk of lime is used in the presence of sulphates, sulphites, or carbonates, it is found that a strong material is obtained. A further advantage of the process is that, owing to the reaction between caustic lime and sodium sulphite or sodium sulphate, the necessary caustic alkali content is formed, and in fact, in a much cheaper way than if caustic soda were added to the digestion liquor.

Continuous Chlorination of Raw Cellulose

BRITISH Patent No. 208,551, which has just been issued, covers the de Vains process of chlorinating cellulosic materials to obtain wood pulp. The process is carried out in a continuous manner under pressure in a vertical glass-lined or enameled vessel, made in cylindrical form and fitted with a stirring device and provided with an inlet pipe near the top, an outlet pipe near the bottom for observations, and a small inlet pipe for chlorine gas at a point about one-third the height of the vessel from the top. The apparatus is completely filled with diluted pulp, which is introduced by means of a pump.

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Malodorous Substances in Sulphate Pulp Mills

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Electrical Maintenance in Paper and Pulp Mills
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Drying and Conditioning Gummed Paper
Drying of Paper
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Detection of Animal Size in Surface Sized Papers
Effect of the Weight of the Needle of the Mullen Paper Tester on the Bursting Strength
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Method for Testing Board for Moisture-Proofness
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Control of Decay and Molding of Wood Pulp
Decay of Wood and Groundwood Pulp
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Methods in Use for Disposal of Lime Sludge in Soda and Sulphate Pulp Mills
Utilization of Decayed Wood in the Chemical Processes
Utilization of Pulpwood Bark as Fuel
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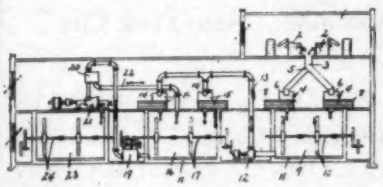
The stirring device is set in motion, chlorine gas is admitted and the valve of the outlet pipe is opened.

Chlorination of the pulp proceeds on the countercurrent principle until an excess of chlorine collects at the top of the vessel to form a manometric chamber, as may be observed from the upper window. By adjusting either the valve of the outlet pipe or the feed of pulp and chlorine, the level of the liquid may be maintained at any desired height and just sufficient chlorine introduced to affect delignification of the fibers.

The chlorinated pulp which leaves the apparatus is neutralized, washed and bleached. Apparatus is also described for the continuous chlorination of cellulosic materials under atmospheric pressure. The diluted pulp is sprinkled from the top of a large stoneware tower, and falls on to a number of baffles, which are superimposed on one another in an irregular manner. Chlorine gas is introduced at the bottom of the tower and should be supplied at such a rate that the pressure in the tower, as indicated by a manometer, is constant. The partially chlorinated pulp then passes through a water seal into reaction tanks, in which the chlorine held in solution by the water completes the chlorination process. These reaction tanks should be of sufficient capacity to permit the pulp to remain in them for at least ten minutes. The pulp is then neutralized by injecting a sufficient quantity of lime water into the last reaction tank, washed and bleached with from one to two per cent of bleaching powder.

Making Paper from Rags

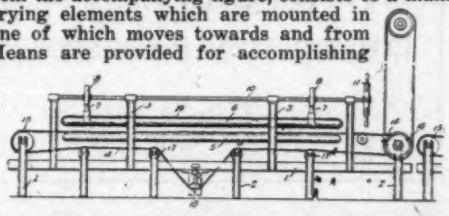
THE accompanying illustration shows the arrangement of the apparatus used in a process of manufacturing paper from rags. The first step consists in cutting the rags into small pieces. These pieces are fed upon the surface of a beater roll which is rotating at high speed. The rags are thus subjected to the action of beating, water being added, until they have been reduced to the condition of half stuff. The half stuff is discharged from the beater into a half stuff chest. The half stock is pumped out of the chest and discharged under high pressure upon a finishing beater roll which is rotating at high speed. In the finishing beater, the half stock is subjected to further beating until the desired consistency is reached. The stock is discharged from the finishing beater and passed through a Jordan engine.



For further details on this process see United States Patent No. 1,507,605.

Apparatus for Drying Pulp Products

UNITED States Patent No. 1,506,789 is concerned with an apparatus for drying pulp products. This machine, as can be seen from the accompanying figure, consists of a main frame, two drying elements which are mounted in that frame, one of which moves towards and from the other. Means are provided for accomplishing this motion and an endless wire belt with its upper stretch carried between and parallel with the opposing faces of the drying elements and passing about rolls completes the apparatus.



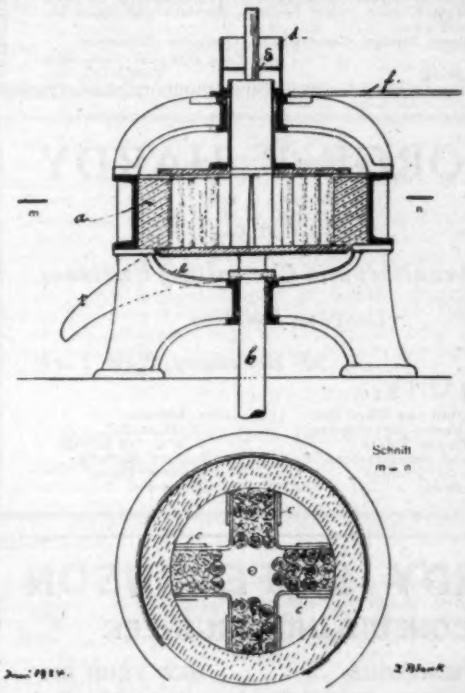
Colloidal Sizing of Paper

IN BRITISH Patent No. 216,923, there is described a process for the colloidal sizing of paper by using a product which is made in the Plauson colloid mill. The size is rendered colloidal in this mill by mechanical action in the presence of a small quantity of a chlorinated hydrocarbon, such as mono- or dichlorbenzene, or tetrachlorethane and is added to the pulp in a high speed heater or in a colloid mill. A positively charged substance, such as alum, or, for cheap papers, ferric oxidem, is added in small quantity. The beating, sizing, bleaching, dyeing, and additions of fillers may be performed either in one colloid mill or in a series of mills.

To accelerate the colloidalizing of the size, a small quantity of solvent such as alkali, or ammonia, may be added. The use of alkali and of alum in sizing may be avoided, and thus a color as ultramarine, sensitive to such substances, may be employed. The process is applicable to the usual pulp materials, and as size, rosin or other artificial or natural resins or resinous products, animal glue, vegetable glue, viscose, starch, dextrin, rubber or rubber latex, montan wax, gelatinous silic acid may be employed.

New Wood Grinder

THE ordinary types of grinders which are employed in the manufacture of mechanical wood pulp are made in such a way that the log of wood is pressed up against the surface of the grindstone by means of pressure exerted against the outer end of the log. This pressure is developed either by mechanical or hydraulic means. Then the stones, whether they are natural stone or artificial, because of the fact that the speed of the grinder is rather high, come in contact with rough spots in the log and are thereby subjected to excess pressure which results in the stones splitting. This has been known to be dangerous to the operators and to the apparatus as well, although precautions are provided against such occurrences.



The object of a recent patent issued in Germany is to avoid these difficulties by building a grinder of special construction as is shown in the accompanying illustrations. The grindstone is made in the form of a hollow cylinder and its outer cylindrical surface is surrounded with a strong iron casing. The inner surface of the hollow cylinder forms the grinding surface and the wooden logs are pressed up against this surface in the process of grinding.

This can be accomplished in three distinct ways. In the first place the wooden logs are thrown up against it by centrifugal force. In this case the log container, which is tied on to the same shaft as the cylindrical stone, rotates in close contact with the stone itself.

In the second place mechanical or hydraulic pressure may be employed in pressing the logs against the surface of the stone. Then the wood container remains stationary while the stone with its iron case rotates. When the first method is employed, there is effected a saving in power and water while certain special advantages as regards safety are secured.

The protective action of the iron casing removes all danger of any parts of the stone flying off, so that the stone itself may be built up of single segments. This is particularly advantageous in the cases where natural stones are employed, as the smaller stones may be employed. Up to the present time the natural stones were very large.

The sharpening of the inner cylindrical grinding surface of the grind stone may be carried out in exactly the same manner as the sharpening the regular grind stones which have been used up to the present time.

The apparatus is fed with the wooden logs through the open top of the grinder. The wood is shown being pressed against the sides of the grind stone in the lower figure. In these figures (a) is the stone, (b) the shaft of the star-shaped rotating box, which holds the wood, (c)(c) are parts of this container showing how the wood comes in contact with the grinding surface, (d) is a protecting collar for the vertical bearing (a) of the wood container, (e) is the chute which leads off the ground wood and (f) is the loading floor from which the wood is dropped into the rotating box holding the logs.

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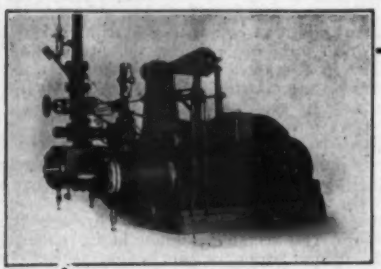

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New York, October 1, 1924.

IMPROVEMENT in the paper market continues, but it is a slow process. Few consumers are buying other than to cover direct requirements. A good deal of complaint is still registered by manufacturers and jobbers over the small volume of a great majority of orders, reflecting the fact that buyers are interested only in paper for which they have immediate want, and yet demand, in the aggregate, is expanding, without a doubt. General improvement in business is compelling consumers to increase their purchases of paper of most kinds. There is no question but that most of the important paper consuming industries are in a vastly better condition than they were, that they are experiencing greater activity and a wider demand for their products, and therefore they find it necessary to absorb larger amounts of paper along with other materials which they use.

However, it cannot be said that the price condition in paper is satisfactory to manufacturers. It is, if anything, just the opposite. Not much complaint is made concerning the current demand for most kinds of paper; it is a fact that a majority of mills are securing ample business to warrant operations comparing very favorably with full production, but paper manufacturers as a general thing are running their plants today on a very small margin of profit. The reason is plainly evident. Competition for business is exceedingly keen, so keen in fact that some manufacturers are leaving nothing undone in their efforts to corral sufficient orders to keep their mills operating on something approaching full output. Obviously, some are cutting prices. The result is that prices are very unsettled, buyers do not hesitate to resort to "shopping" so as to get supplies at the lowest possible cost, and many mills are making and marketing paper at prices which net scant or no profit.

It seems somewhat absurd to witness paper of most kinds selling at the same or lower prices that prevailed a few months ago, whereas in the interim nearly every description of raw material entering into the manufacture of paper has recorded appreciable advancement in cost. Wood pulp is higher than it was, rag stock has scored a sharp rise, while prices of waste paper, old rope, bagging and many kinds of chemicals are above the levels obtaining not so long ago. It would seem as if this is the best argument in the world that paper prices are due for an advance. Certainly they will not remain on prevailing levels if demand continues to increase. The moment demand reaches a point where the great bulk of paper being produced is afforded a consuming outlet, prices are going to mount. The law of supply and demand will have sway unquestionably. The great difficulty thus far this year in the paper industry has been that demand has not measured up to the productive capacity of the mills of the country, absorbing larger supplies, the fundamental position of the market is strengthening and it seems only a matter of time when conditions will right themselves to a degree where more profitable prices for the producer will prevail.

On every hand are indications of increasing consumption of paper. Newsprint consumption especially is on the rise. Since Labor Day and the unofficial ending of the summer publishers have been steadily enlarging their issues, and, taking the New York daily newspapers as a criterion, it can be stated that fully 25 per cent more print paper is being consumed at present than during the summer months. New York publishers are frequently printing weekday issues of as many as 48 pages for the morning dailies, while afternoon issues run all the way from 24 to in excess of 50 pages, one afternoon paper putting out an issue last Friday of 62 pages. Circulation also is growing, which means additional consumption. With the national political campaign waxing warm, with the fall shopping season in full swing, and with the reading public manifesting much interest in recent sporting events, international and otherwise, more newspapers are being bought. Another factor is that some publishers have reduced their prices, two of the best known newspapers in the East having announced recently a cut in price from three to two cents.

The technical position of fine papers is very firm. Production costs have steadily mounted in recent months and yet prices of fine papers have shown little change. Manufacturers seem hesitant to alter quotations in fear of disturbing the buying movement, but higher prices seem pending; certainly they cannot remain on present levels indefinitely unless there is a drastic revision downward of manufacturing costs. Fine paper demand is good. Orders are coming in regularly and for fairly large amounts of bond and ledger papers; moreover, the outlook is very promising.

Book paper demand is fair, but this class of paper is in most unfavorable quotable position. As an example, jobbers have told lately of buying machine finished book paper from mills at lower prices than they had succeeded in getting the same kind of paper anytime this year before, this being due solely to certain mills cutting prices to wean business away from competitors. Book paper consumption is rising, along with news print, and there seems every reason to expect demand will continue to broaden for at least the balance of the current year.

Coarse papers are in more or less routine demand. Foreign competition is still felt but possibly not to as keen a degree as formerly, since prices of Swedish wrapping papers have been advanced. Tissue is fairly active and is steady in price.

Box boards enjoyed a spurt of demand during September which, however, was not long lived. Prices jumped rapidly so long as consumers kept up buying, but have since showed a little weakening. On the whole, board mills are moderately busy.

Import Committee Doing Good Work

"Justice to the paper industry in this country and its self-preservation as well demand that it take concerted action to stop the violations of the law involved in the fraudulent and unfair practices in the importation of paper made in foreign countries."

This is a characteristic statement made in a letter sent to every paper manufacturer in the United States by the Import Committee of the American Paper Industry, which has now made its formal announcement to the paper industry of what will be necessary if these abuses are to be checked. The Import Committee of the American Paper Industry has been planning its course with great care, both as to the field to be covered and the method of its operation; and has, in the letter of which the above quotation is a part, made its definite announcement of its future plans. The response to this call to action by the paper idustry has been exceedingly gratifying to the Committee.

"European countries are already expanding their industries for the purpose of paying their debts in exported goods," the letter continues. "With the Dawes plan in operation, economists state that exports of paper from Europe will be greater than ever. It is the intention of this committee to see that present and future imports of European paper are strictly in accordance with the law.

"While this committee has been in existence only a short time, it has already uncovered many violations of the law. For example, writing paper has been coming in misclassified or undervalued, and thus evading the proper duty. Wrapping and book papers are being imported in the same way. Much paper of higher grades has evaded the payment of any duty at all, being classified as newsprint. These are merely a few instances.

"It would not be only unfair, but obviously impossible for a few manufacturers to bear the entire burden of this undertaking. As every paper manufacturer will profit by this work, each one should stand his proportion of the cost, and we are sure that each one wants to do so. This is your fight."

Herbert J. Grey, formerly operating as the Associated Paper Sales Company, 25 West Thirty-third street, New York City, and, lately, as the S. C. Landsberg Associates, 18 West Thirty-fourth street, has announced a new company. On September 15, he will do business under the name of "Six-Sixty Sealing Tape Company," with an office at 20 West Thirty-fourth street, New York City. Mr. Grey will still continue his other company, the H. J. Grey Company, 228 East Forty-fourth street.

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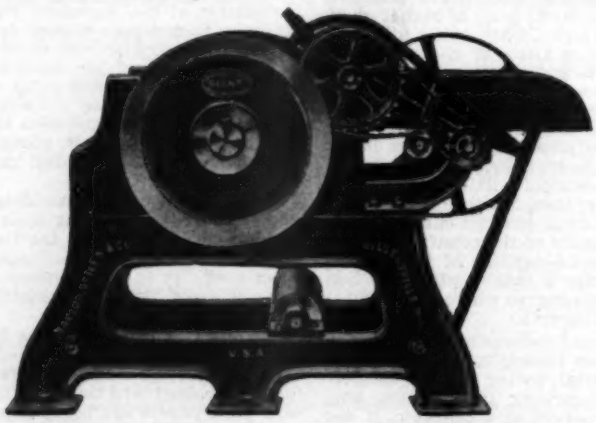

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Papermaking Rags

Most reports tell of demand for papermaking rags arising rather slowly; that is, that paper mills are buying carefully and for the most part to cover direct requirements only, yet it is asserted that supplies are moving into consuming channels in a fairly consistent manner and that the technical position of the market is strong. Dealers declare that the situation, from the point of view of supplies, has shown little or no improvement. It is contended that nothing like normal amounts of rags are coming in from collection sources, that mixed rags are in light supply and high in price, and that this, coupled with the high cost of sorting and preparing material for mills, is keeping the output of rags on a small scale.

There are numerous indications that consumers are absorbing the great bulk of the rags collected and sorted for paper mill uses. Perhaps dealers are accumulating some of the specialty grades but this is more of an exception than the rule. Standard classes of rags are moving along in a steady way and there are few signs of any worthwhile accumulations in dealers' warehouses. If anything, the average handler of papermaking rags is quickly disposing of stock as rapidly as it is made ready for shipment to mills, and, in some cases, probably is experiencing a bigger demand than he can satisfy under present market conditions. Obviously under such circumstances prices are holding steady to firm. No broad changes have occurred in the last month with the possible exception of some fairly sharp advances in certain kinds of new cuttings, due to the pronounced scarcity of such rags, yet prices have fluctuated on nearly all descriptions of rags used by paper manufacturers—some showing slight recessions and others a little uptrend in value.

Importations from Europe keep up on a rather large scale. Importers put a good deal of stress on the stiff prices ruling on the other side of the Atlantic and say it is becoming a problem to purchase rags abroad against the figures American mills are willing to grant and realize a profit, yet it is noticed that arrivals at New York and other U. S. Atlantic ports are about as heavy as at any time earlier in the year. Certainly rag imports into this country are running above normal, and have been for quite a few months. It would seem as if the supply in Europe would give signs of petering out, and importers assert this is just what is taking place though indications are no great difficulty has thus far been experienced in securing ample amounts of rags abroad. On the other hand it seems a safe assertion to make that paper manufacturers in the United States cannot expect to obtain as large supplies from European countries in the next few months as they have in the last year or so. Time will have to be given the European dealers to accumulate fresh stocks. Late advices from the other side of the Atlantic have, almost without exception, stated that dealers' holdings had been greatly reduced, and that the available supply on which American buyers can draw is no lower than at any time for a long period, or since the late war. Therefore, if consumption keeps up in the volume reached in recent months and paper mills continue to buy rags in similar quantities to the amounts they have absorbed thus far this year, it would not be surprising to witness a fairly sharp rise in prices if for no other reason than the pressure of limited supplies.

New cuttings are in a particularly strong market position. Available supplies are low, reflecting the curtailed operations of clothing manufacturing establishments during the summer and the consequent small production of cotton cuttings. Dealers declare they are carrying very light stocks and that it is very difficult to replenish their holdings irrespective of the prices they are willing to grant. Some sharp advances have been recorded in prices of certain grades. No. 1 white shirt cuttings are quoted at a minimum of 15 cents per pound f.o.b. shipping points, and quotations on these rags generally range around 15.50 cents. No. 2 white shirt cuttings are quoted at 10.50 cents, unbleached muslins at 14 cents, light silesias at 11.50 cents, washables at 8.25 cents, blue overall cuttings at 11 cents and white lawns at 13 cents. Consumers other than paper manufacturers have been purchasing the cheaper qualities of cuttings and have run prices of these rags upward also.

Prices of old whites and thirds and blues have eased just a trifle. Mills using such rags apparently filled their major requirements for a time by recent purchases and have been less anxious for supplies. However, dealers continue to quote around 8 cents a pound at shipping points for repacked No. 1 whites, and ask 5.25 to 5.75 cents, depending on the packing, for No. 2 repacked whites. Repacked thirds and blues are quoted 4 to 4.25 cents, and rough packing 3.25 to 3.50 cents.

Roofing rags exhibited a firmer tone in the closing days of September, due to a revival of demand in some consuming quarters. Where prices reacted to around 2.25 cents a pound f.o.b. New York for No. 1 packing prior to the stiffening of the market, at least 2.35 cents at shipping points is now asked, while No. 2 roofing is quoted on a range of 2.15 to 2.30 cents per pound at dealers' points. Foreign dark cottons are reported selling from 2.20 to 2.30 cents ex dock New York. Imported rags in general display a steady price tone.

Average quotations f.o.b. shipping points and ex dock New York follow:

New stock—	New York and Chicago
White shirt cuttings, No. 1	15.00-15.50
White shirt cuttings, No. 2	10.00-10.50
Fancy shirt cuttings	9.25- 9.50
Washables, No. 1	8.25- 8.50
Unbleached muslins	14.00-14.25
White lawns	13.00-13.50
Overall cuttings, blue	11.00-11.50
Black silesias	6.00- 6.50
Light flannelettes	12.25-12.50
Canton flannels, bleached	13.50-13.75
Canton flannels, unbleached	12.00-12.25
Shoe cuttings, bleached	12.25-12.75
Shoe cuttings, unbleached	11.00-11.50
Light silesias	11.25-11.50
O. D. khaki cuttings	6.75- 7.00
Mixed khaki cuttings	6.00- 6.50
Corduroy cuttings	6.00- 6.25
Cottonade cuttings	5.25- 5.50
Linens, No. 1 white, foreign	16.50-17.50
Light prints, foreign	7.50- 8.00
Old stock—	
Whites, No. 1, repacked	7.75- 8.25
Whites, No. 2, repacked	5.25- 5.75
Whites, house soiled	3.75- 4.00
Whites, street soiled	3.50- 3.75
Lace curtains	5.50- 6.00
Thirds and blues, rough	3.25- 3.50
Thirds and blues, repacked	4.00- 4.25
Black stockings	4.25- 4.50
Cotton canvas, No. 1	5.00- 5.50
White cotton batting	4.50- 4.75
Roofing, No. 1	2.35- 2.50
Roofing, No. 2	2.15- 2.30
Dark colored cottons, foreign	2.20- 2.30
Blue linens, foreign	5.50- 6.00
Gray linens, foreign	6.50- 7.00
White linens, foreign	11.00-12.00
Light prints, extra, foreign	5.00- 5.25

Rope and Bagging

Old rope and bagging are firm in price and the tendency is upward decidedly. In fact, some advancement has been scored in recent weeks, and there seems to be a good deal of pressure on the part of dealers and importers to push values up a little higher, traders in these commodities being aided in their efforts to secure advanced figures by a comparatively small supply coming into the market.

Dealers in general demand between 6.25 and 6.50 cents per pound, f.o.b. shipping points for domestic old manila rope of No. 1 grade, and are getting these rates without much difficulty. Paper mills are buying and appear to be in need of supplies. Foreign manila rope is fetching about the same prices as the domestic article, and importers declare that their bids to dealers abroad are frequently turned down, indicating that sellers in Europe are bent on securing higher prices.

Gunny bagging has scored an advance. Sales of No. 1 domestic gunny have been reported at 2.20 and 2.25 cents a

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pound at shipping points, and reports assert the market is well sold up on this material. Roofing bagging is moving freely at around 1.30 cents a pound at dealers' points, while No. 1 scrap bagging is quoted on a range of 1.60 to 1.80 cents depending on the quality of packing.

F.o.b. shipping point and ex dock New York quotations are as follows:

	New York and Chicago
Gunny, No. 1 domestic	2.15-2.25
Gunny, No. 1 foreign	2.10-2.20
Scrap bagging, No. 1	1.60-1.80
Roofing bagging	1.25-1.35
Wool tares, heavy	1.85-2.00
Wool tares, light	1.75-1.85
Manila rope, No. 1, foreign	6.25-6.50
Manila rope, No. 1, domestic	6.25-6.50
Sisal strings	2.25-2.50
Mixed strings	1.20-1.40

Old Paper

Contrary to general expectations, the market for old paper exhibited a great deal of weakness all during September. Dealers had looked for a firm and active market during that month, owing to the sharp advance in August and also owing to the fact that usually in September board mills come actively into the waste paper market to buy. However, the situation developed pronounced easiness early in the month when demand from consuming quarters suddenly subsided and the trend of prices was downward during the entire month of September.

The eastern market reacted first and the break in prices there was so sharp that the effect was soon felt in the Middle West, where prices eventually tumbled. However, prices in the West continue substantially higher than in the East yet not sufficiently higher to permit consumers in the West to buy in the East profitably and pay the freight on eastern shipments. Shavings have declined to between 3.50 and 3.75 cents a pound, f. o. b. shipping points for No. 1 hard white, and 2.90 to 3.15 cents for No. 1 soft white shavings. Heavy No. 1 books are down to where sales at 1.40 cents a pound, f.o.b. New York, have been recorded, while a sharp decline has occurred in old No. 1 kraft paper to 2 cents a pound and less at dealers' shipping points. Folded news is quoted at 70 cents a hundred pounds in the East and around 90 cents in the west, while No. 1 mixed paper is selling at 60 cents in the East and at an average price of 80 cents in the West. The market is in that position where prices depend to a large extent on the quality of packing involved in offers by dealers to mills, thereby putting quotations on a rather wide range.

F.o.b. shipping point quotations are as follows:

	New York and Chicago
Hard white shavings, No. 1	3.50-3.75
Hard white shavings, No. 2	3.00-3.25
Soft white shavings	2.90-3.15
Colored shavings	1.50-1.75
Heavy book, No. 1	1.40-1.60
Crumpled book, No. 1	1.20-1.30
Ledger stock	1.65-1.80
Kraft, No. 1	1.90-2.10
Manilas, No. 1	1.00-1.10
White blank news	2.00-2.10
Over-issue news, No. 1	.90-1.10
Folded news	.70- .90
Mill wrappings	.70- .80
Mixed paper, No. 1	.60- .80
Common paper	.45- .55

Chemical Pulp

Demand for wood pulp has quieted in recent weeks. Two major reasons are advanced for the decrease in buying, one of which is that paper and board manufacturers covered their requirements to such an extent by purchases earlier in the year that they have been enabled to let down in their buying, and the other that the outlook in the paper market has been so uncertain that manufacturers have been reluctant about increasing their commitments of pulp and have therefore held off in additional purchasing except to satisfy immediate and pressing needs.

The market, insofar as quoted prices are concerned, has developed no great change, however. Producers argue that pulp prices are on levels where they cannot possibly afford to reduce them any further, and quotations consequently have held about steady on previous levels. In some exceptional cases slight advancement has been noted. The undertone in pulp is firm, without a doubt, because the statistical condition of the market is unmistakably strong. It seems very possible

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that a pinch in wood pulp supplies may develop this coming winter. Scandinavian mills are declared to be well sold up and should the threatened strike occur in Sweden, putting a stop to pulp production in that country, the pulp manufacturer in the United States might again come into his own and be able to produce and market pulp at a profit. At any rate, there appears every reason to believe there will be no big surplus of any kind of pulp next winter and prospects for favorable business for domestic producers are better than they have been in a long time.

F.o.b. pulp mill quotations are as follows:

Bleached sulphite	3.75-4.25
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1	2.50-2.75
News grade sulphite	2.40-2.65
Soda pulp, bleached	3.50-3.75
Mitscherlich, unbleached	3.25-3.75
Kraft, No. 1	2.75-3.00
Screenings, refined	1.50-1.75

Mechanical Pulp

Mechanical wood pulp is enjoying a fairly active demand. Consumers are absorbing supplies in a consistent manner and are, in the aggregate, removing about all the ground wood that is finding its way into the open market. In fact, it is stated that it is no easy matter to locate tonnage lots of ground wood for prompt shipment. Grinders are better situated today than they were a few weeks ago when they were badly handicapped by low water, and yet reports state production is not yet on a normal scale and that a good many grinders are conserving stocks against their own requirements and are offering very little supply to outside buyers.

Domestic ground wood is quoted on a price range of $30 to $35 a ton at grinding plants, depending on the moisture content and the freight to consuming centres. Canadian producers are reported securing $31 to $35 a ton at pulp mills for ground wood, and it is stated that U. S. consumers are purchasing a good part of their requirements across the border owing to the light domestic supply available. Imported ground wood is quoted around $34 a short ton ex dock New York.

Chemicals

Papermaking chemicals are in fairly good demand. It is probably true that the major movement at present is against contracts or back orders, yet consumers are coming into evidence as buyers in spasmodic fashion and absorbing additional supplies of moderate magnitude. Prices, as quoted, exhibit no broad changes. Casein is selling at around 10.50 cents a pound, while caustic soda is quoted at 3.10 to 3.15 cents per pound on a flat basis, f.o.b. works for spot shipment, and soda ash at 1.38 cents at works in bags. Rosin is slightly higher at 6 cents for the papermaking Grade E, and powdered blanc fixe is quoted at 3.75 to 4 cents a pound.

Average quotations are as follows:

Alum, lump ammonia	3.25- 3.50
Alum, lump starch	3.75- 4.00
Blanc fixe, powdered	3.75- 4.00
Bleaching powder	1.90- 2.00
Brimstone (long ton, at mine)	18.00-20.00
Casein (duty paid)	10.00-11.00
Caustic soda, spot delivery	3.10- 3.15
China clay, domestic washed	12.00-15.00
China clay, foreign	15.00-20.00
Rosin, grade E	6.00-
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38
Starch, papermakers', in bags	3.40- 3.70
Talc (ton)	16.00-17.00

Tupelo as a Pulp Wood

A study of the growth of tupelo in second-growth stands has for some time been under way in the South, and the members of the Southern Forest Experiment Station who have it in hand hope soon to be in a position to make the results public. The imporance of the study, according to the United States Forest Service, lies in the fact that a mixture of half tupelo and half southern pine has been found to produce an excellent quality of book paper. The consequent interest in this wood on the part of the pulp and paper industry warrants obtaining exact information regarding its growth and yield.

The South has furnished pulpwood in the past, but only for the manufacture of wrapping paper, containers and similar products. If tupelo comes up to its promise as an important pulpwood, it is expected that the result will be of benefit both to the paper industry and to the timber owners of the South.

MITTS & MERRILL

The Mitts & Merrill Shredder will reduce magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock in a thoroughly economical manner.

Built in sizes with spouts ranging from 18 to 45 inches wide.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

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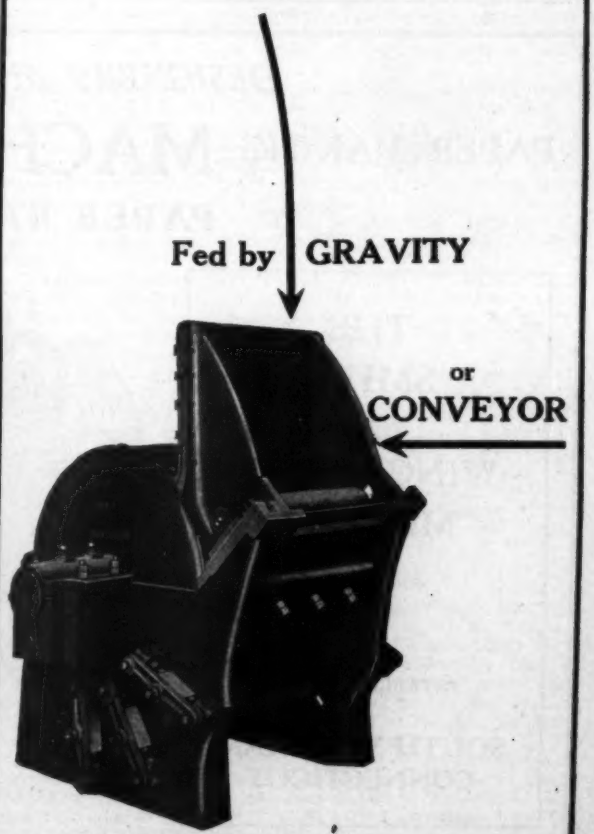
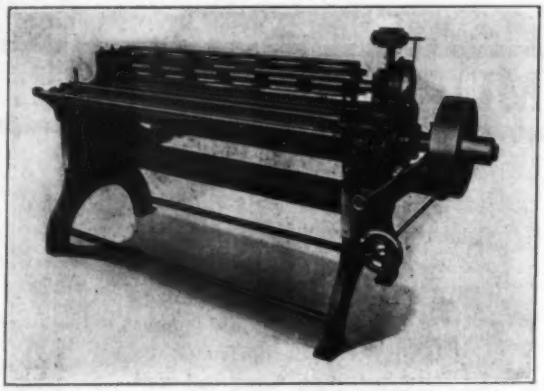




Drum Winder Toilet Machine

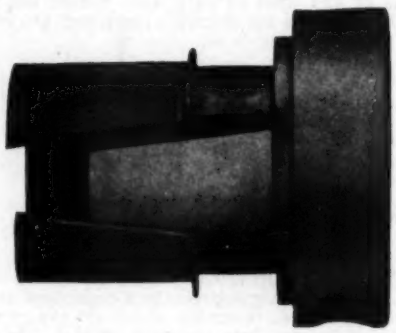
THIS machine winds a hard roll. The winding shaft rotates between two drums. The slitters are located in one drum. Various lengths of collars can be furnished for the slitter drum to accommodate different lengths of rolls desired.

Two core shafts are furnished with each machine, also two back stand shafts for Jumbo Rolls. The machine is ball bearing throughout, including the drive pulley.

Hudson-Sharp Machine Co.
Green Bay, Wis.

Selling Agents:
Gibbs-Brower Co., 281 Broadway, N. Y. C.;
166 Jackson Blvd., Chicago

THE ONEIDA CHUCK for use with Paper or Strawboard Cores



This chuck is so designed that it cannot split or damage the paper core on which the paper is wound and allows the roll to be run down to the last thickness of paper.

The conical or wedge-shaped chucks now commonly used with paper cores invariably split the paper cores so that from ½" to 1" of paper next to the core is damaged. The elimination of this waste will soon pay for the equipment on each machine.

Our Chuck allows the use of a cheap non-returnable paper core that once used can be thrown with the waste and sold.

Let us make up a trial set for you

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RHINELANDER, WISCONSIN
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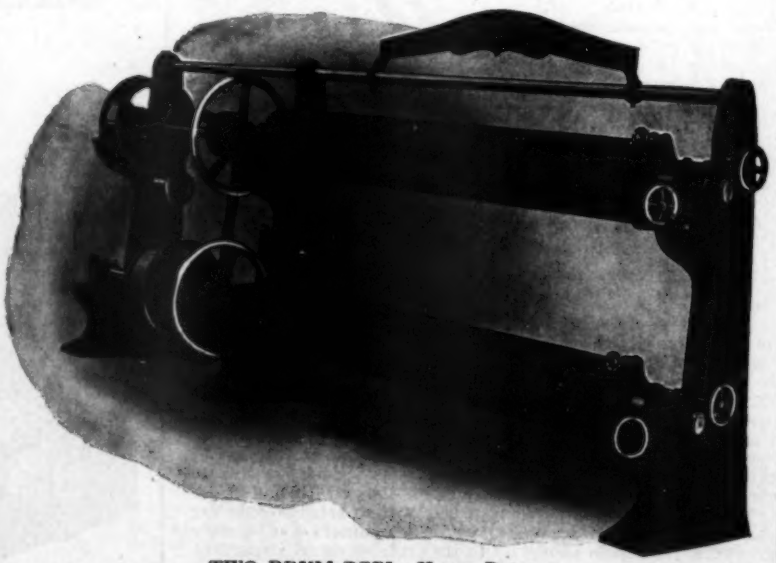

TWO DRUM REEL—Heavy Pattern

New Papers

Writing—	
White rag	20-45
White sulphite	11-30
Colored rag	16-40
Ledger—	
White rag	20-50
White sulphite	13-30
Colored sulphite	40-30
Colored rag	16-50
Bonds—	
White rag	19-45
White sulphite	9-30
Colored sulphite	10-30
Colored rag	18-45
Book—	
No. 1 S. & S. C.	6.75- 7.50
Machine finished	6.50- 7.25
English finished	6.75- 7.50
Coated and enameled	8.50-14.00
Lithographed, M. F.	9.00-15.00
Newsprint—	
Rolls, contract	3.65 .....
Rolls, transient	3.85- 4.25
Sheets	4.25- 4.50
Side runs	3.25- 3.75
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24-36	.70- .75
No. 1 manila, 24-36	.70- .75
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	5.75- 6.50
No. 2 Kraft	5.25- 5.75
Boards—	New York and Chicago
Solid news	52.50-55.00
Straw	55.00-60.00
Plain chip	45.00-50.00
White coated chip	60.00-65.00
Manila coated chip	57.50-60.00
Binder's board	70.00-75.00

Jacob Kindleberger Tells of Mexican Needs

"In Mexico, the military ranks first, with labor second, and capital third. In the United States and every other nation that ever attained true greatness, capital is placed first, with labor second and the military third."

This statement was made by Jacob Kindleberger, president of the Kalamazoo Vegetable Parchment Company, who has just returned from a junket to Mexico, being one of a party made up of members of the American Exporters' Association. While Mr. Kindleberger's stay in the land south of the Rio Grande was rather brief, it was long enough for him to see the evil effects of militarism developed to the highest point.

"Mexico needs the great American middle class," added Mr. Kindleberger. "That element of society would add permanence to the social structure. There are today but two classes in Mexico, the proud, aristocratic Spaniard on the one hand, the wretchedly poor and ignorant peon on the other. The one hope of the peon is to become a soldier, perhaps rise to the rank of general and dictator and then live in luxury in some European capital city on his ill-gotten gains.

"Another need of Mexico is the public school system. There is no hope for progress in the country as long as the present state of ignorance exists. With a wonderful climate and inexhaustible resources at hand, Mexicans do not live, they merely exist. Not once during my stay in that country did I see a smile on the face of a working man, or the slightest indication of contentment, or satisfaction with job or place in life."

Mr. Kindleberger during his stay in Mexico made an interesting sight-seeing trip to the great mills of the San Rafael Paper Company, located in the mountains about 50 miles from Mexico City. On this tour he was accompanied by W. J. Lawrence, vice president and general manager of the Western Paper Makers' Chemical Company. Mr. Lawrence has been selling size to the Mexican concern for years and on the recent trip placed order said to approach $40,000 in value.

"The San Rafael Paper Company, which makes enormous amounts of wrapping paper, plans to size that product in the future," said Mr. Lawrence. "It will save much raw material as a result. The mills of this concern are located at the base of Mount Popocatepetl, a most sightly location."

In speaking of the concern and its operations, Mr. Kindleberger said: "The main mill is built on the side of a mountain and is what is known as a gravity mill, making it possible to handle all stock without pumping, as most of the mills in the United States do.

"At the highest point is the wood room, where the pulp is made. They use some native timber, but that is generally of poor quality and has to be mixed with foreign sulphite to secure the right consistency. Step by step below in order are the washing room, bleaching room, beater room, machine room, and finishing and shipping rooms.

"Seven paper machines are operated in the main mill and three in the second mill, which makes a very high grade bond paper. Two of the machines are running 700 feet a minute on wrapping paper. I have never seen a finer or more efficient mill. The management has gone to extremes in the matter of system. There are over 500 forms in use in the various departments. Every ounce of fibre, every gallon of water and every pound of steam must be accounted for.

"In addition to the mills proper, this concern maintains a machine shop foundry and carpenter shop, all of the highest type. The mills are built of stone and surrounded by high stone walls, largely as a matter of protection. Watchmen, fully armed, are in evidence everywhere, while everything used in the mill is kept under lock and key with a heavy guard posted.

"The village in which the mills are located is owned by the company, and I am glad to say that much has been done to make life agreeable for the 1,500 employees in the plant. Conveniences are numerous and the workmen seem to be of a far higher type than one usually sees in that country. While Mexicans are hard to teach, they make good workmen when educated. Just now labor troubles are looming for this concern. Only the week before we arrived the company was forced to pay a union labor leader 2,000 pesos to keep away a strike.

"Business is in constant fear of an eruption. To lessen the possibility of loss due to a strike, the San Rafael Paper Company carries all its finished paper in warehouse in the City of Mexico in the name of the large paper jobbers of that city. They figure that trouble at the mill of any kind would lead immediately to sympathetic action among the workers in Mexico City, and one of the first steps would be the confiscation and destruction of any of the company's product that might be in the capital city. Capital and capitalists are in constant danger and always on guard. It is surprising how many of the aristocrats and big men in business carry six shooters for personal protection. They took a great deal of pride in informing me that Mexico, not Russia, is the home of bolshevism."

Outterson Estate $15,568

James A. Outterson, widely known paper manufacturer, who died May 6, 1922, left a net estate of only $15,568, according to an appraisal of his property filed in New York, although he had property worth $134,191. That Mr. Outterson believed he would leave more than $600,000 when he made his will in November, 1920, was indicated by the fact that he set aside trust funds of $400,000 for his widow, and $200,000 for a friend, Ella M. Murphy, formerly of Carthage, N. Y., where Mr. Outterson was born. Because of the shrinkage in the value of the estate, these bequests were reduced to about $10,000 to the widow and less than $5,000 to the friend. Mr. Outterson also bequeathed $25,000 to the Carthage Free Library, which was reduced to $622.

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Canadian Kraft Limited, Three Rivers, Canada
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Howard Smith Paper Mills, Montreal, Quebec
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Lowest Prices

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EXPORTS

Paper exports from the United States continued to show a downward tendency in July last, the total value of shipments abroad for the month being 13 per cent under those for June, and also below July, 1923, exports, according to statistics issued by the Department of Commerce in Washington. The losses were more or less distributed among all classes of paper, news print and hanging papers being practically the only ones during July to show an increase in the quantity exported as compared with the same month in 1923. Shipments of cover, surface-coated, tissue and crepe, and cash register papers, and papeteries, however, were larger than during June last, while exports of hanging or wall papers more than doubled.

A better showing was made by the board branch of the industry, shipments of all items, with the exception of wall boards, showing an increase in July. Paper board and straw board exports were 40 per cent greater than in June, and 30 per cent larger than in July, 1923, and while exports of bristols and bristol boards again dropped off 10 per cent compared with June, they were 42 per cent higher than in July a year ago. Shipments of boxes and cartons were also considerably larger during July.

The following table shows the quantity and value of the chief classes of paper and board exported in July as compared with the preceding month and the corresponding month in 1923:

	July, 1923		June, 1924		July, 1924	
Classes:	Pounds	Value	Pounds	Value	Pounds	Value
Newsprint	1,959,981	$102,561	3,779,265	$198,225	1,994,485	$102,059
Book paper, not coated	3,010,731	326,827	1,306,241	160,462	1,172,511	155,817
Wrapping; not including kraft:	2,054,004	159,128	1,751,060	160,187	1,734,406	131,596
Paper board and strawboard	5,111,563	232,790	6,328,615	226,708	6,617,900	257,941
Photographic paper	104,161	120,373	153,240	163,797	126,442	117,701
All other paper		1,137,543		1,183,768		1,053,769
Total		2,079,222		2,093,147		1,818,883

IMPORTS

Wood Pulp

Activity in the imported wood pulp trade is on a much smaller scale than a few weeks ago. Demand has subsided to a pronounced degree, due, it would appear, to the fact that paper manufacturers bought rather heavily some time ago and are now waiting until better assured regarding the future position of the paper market before engaging in further purchases of raw material. Nevertheless, the tone of the market is exceedingly firm. Pulp prices are tending higher, and the statistical position seems to be strengthening day by day as the winter draws nearer. Many in the trade expect that a squeeze in supplies will occur toward the end of the year if all the reports concerning the situation abroad are anywhere near true. Swedish mills are reported well sold up for the balance of 1924, and also to have booked orders for sizable amounts of pulp for first open water shipment next spring. Very little supply still remains available in Scandinavia for shipment between the present and the time the Baltic is due to freeze over, and certain kinds of pulp in particular are said to be in short supply across the Atlantic. Reports also state that there is quite a probability that a strike will occur in the Swedish pulp industry at the end of this year. Mill operatives plan to demand a wage increase when their agreement with the manufacturers expires on December 31 next, and the mill owners have announced no advance will be granted, and a strike and a complete tie-up of the pulp and paper industry in Sweden is threatened.

Pulp imports into the United States continue large. In fact, arrivals during July—the last month so far covered by Government statistics—were heavier than in any month tor this year thus far with the exception of February. A total of 102361 net tons of chemical pulp was imported in July, compared with 78,416 tons in June, 73,969 tons in May, 56,256 tons in April, 77,402 tons in March, 110,932 tons in February, and 79,097 tons in January. July imports brought the total for the first seven months of this year up to 578,433 tons, giving a monthly average of 82,631 net tons, contrasted with a monthly average of 85,130 tons in the corresponding period last year. Imports of ground wood in July last amounted to 16,109 tons, making a total for the first seven months of this year of 107,850 net tons, or a monthly average of 15,407 tons, against 15,076 tons in the same time a year ago.

Importers are very firm in quoting Kraft pulp, and Swedish Kraft is held at 2.80 to 3 cents a pound ex-dock New York for standard brands. Sales have been made at 3 cents, it is stated, and prices seem definitely pointed to that level, with offers mostly involving limited-sized lots of such pulp and with reports stating that mills in Sweden are almost completely sold out on Kraft for the balance of this year. Strong prime unbleached sulphite is quoted around 2.75 or 2.80 cents ex-dock New York for the Scandinavian grades though cheaper pulp is in the market, German unbleached sulphite of good quality being available at 2.60 and 2.65 cents on the dock. Foreign bleached sulphite of No. 1 grade is quoted on a range of 3.75 to 4.25 cents ex-dock New York, and easy bleaching sulphite at 2.85 to 3.15 cents per pound. Scandinavian ground wood is quoted around $35 a short ton on the dock at American Atlantic ports.

Receipts at the port of New York in September and curdent market quotations ex-dock New York follow:

Bleached sulphite, No. 1	3.75- 4.25
Unbleached sulphite, strong, No. 1	2.60- 2.85
Unbleached sulphite, No. 2	2.50- 2.75
Easy bleaching sulphite	2.85- 3.15
Mitscherlich unbleached, genuine	2.85- 3.15
Mitscherlich unbleached, ordinary	2.60- 2.75
Kraft, standard Swedish	2.80- 3.00
Ground wood, per ton	34.00-36.00

J. Andersen & Co., 1,710 bls. from Greaker, 3,000 from Harnosand, 1,200 from Iggesund, 1,250 from Bremen, 250 from Gothenburg and 1,050 from Sarpsborg; Central Union Trust Co., 955 bls. from Greaker and 1,205 from Sarpsbog; Hartig Pulp Co., 500 bls. from Hamburg, 1,114 from Rotterdam and 750 from Swedish ports; Castle & Overton, 2,035 bls. from Bremen, 2,824 from Rotterdam and 4,170 from Hamburg; Bulkley, Dunton & Co., 1,955 bls. from Bremen, 1,750 from Gefle, 3,125 from Iggesund and 1,875 from Swedish ports; Ira L. Beebe & Co., 5,924 bls. from Hamburg; H. Hollesen, Inc., 1,050 bls. from Hamburg; Equitable Trust Co., 730 bls. from Hamburg; Lagerloef Trading Co., 788 bls. from Bremen; National City Bank, 2,376 bls. from Hamburg; E. M. Sergeant Co., 330 bls. from Christiania and 600 from Harnosand; Nilsen, Lyon & Co., 2,500 bls. from Christiania; Scandinavian Pulp Agency, 127 bls. from Copenhagen and 3,575 from Swedish ports Guaranty Trust Co., 450 bls. from Copenhagen, 1,500 from Swedish ports and 166 from Hamburg; New York Trust Co., 731 bls. from Trieste and 740 from Hamburg; Pagel, Horton & Co., 4,625 bls. from Gefle, 1,500 from Harnosand and 10,025 from Swedish ports; Johaneson, Wales & Sparre, 7,080 bls. from Harnosand, 2,800 from Swedish ports and 2,415 from Gothenburg; Poland Paper Co., 5,413 bls. from Trieste; M. Gottesman & Co., 4,000 bls. from Jugo-Slavia; Mechanics & Metals National Bank, 1,000 bls. from Christiania; E. J. Keller Co., 403 bls. from Hamburg; Kidder Peabody Acceptance Corp., 125 bls. from Christiania; Howell-Donaldson Co., 668 bls. from Hamburg; Price & Pierce, 800 bls. from Gothenburg; Tidewater Paper Mills Co., 6,236 bls. from Murray Bay Order, 1.948 bls. from Hamburg, 150 from Copenhagen, 625 from Gefle, 950 from Swedish ports, 1,852 from Kotka, 2,625 from Borga and 8,700 from Harnosand.

Paper Stock

Large receipts of rags featured importations of paper-making raw materials other than pulp at the port of New York in September. Some unusually big shipments of rag stock arrived during the month, and there were also fairly

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Jenssen Acid Towers
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Our pulp is made from Canadian Spruce
We ship in sheets, baled

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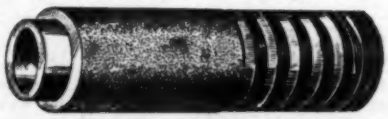

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Has greater carrying capacity than iron pipe, costs less to install and much less liable to freeze than any other type pipe.

Write for catalogue and prices

Standard Wood Pipe Co.
Williamsport, Penna., U. S. A.

large amounts of old rope, bagging and miscellaneous materials received. Imports of papermaking stock of all kinds through the port of New York in September, with names of consignees, were as follows:

Old Rope

Brown Bros. & Co., 32 coils from Bremen, 146 coils from Hamburg, 339 coils from Bristol, 27 coils and 248 bls. from Antwerp, 71 coils from Christiania, 185 coils from Hull, 262 coils from Rotterdam and 218 coils from Newcastle; E. J. Keller Co., 222 coils from Hull, 351 bls. from Rotterdam, 323 bls. from London and 46 bls. from Hamburg; W. Schall & Co., 18 coils from Hamburg and 607 coils from Genoa; Ellerman's Wilson S. S. Line, 293 coils from London; Castle & Overton, 47 bls. and 23 coils from Havre; Banque Belge, 33 coils from Leith and 29 bls. from Barcelona; R. Wolf, 22 bls. from Rotterdam; Salomon Bros. & Co., 145 bls. from Marseilles; E. Butterworth & Co., 76 bls. from Marseilles; William Steck & Co., 34 coils from Hamburg; T. D. Downing & Co., 50 bls. from Manchester; Daniel M. Hicks, Inc., 31 bls. from Manchester; United States Mortgage & Trust Co., 100 bls. from Bremen; W. H. Cummings & Sons, 53 bls. and 19 coils from Havre; Philadelphia National Bank, 76 coils from Glasgow; Panama Railroad Co., 50 bls. from Colon; S. Birkenstein & Sons, 170 coils from Newcastle; Order, 104 bls. and 23 coils from Hamburg, 45 bls. from Rotterdam and 9 bls. from Huelva.

Old Bagging

Castle & Overton, 60 bls. from Rotterdam; E. J. Keller Co., 298 bls. from Rotterdam, 763 from Hamburg, 210 from Havre and 433 from Antwerp G. M. Graves Co., 69 bls from Glasgow and 110 from Rotterdam Mechanics & Metals National Bank, 239 bls. from Manchester and 132 from Havre Anglo-South American Trust Co., 142 bls. from Manchester and 55 from Antwerp S. Birkenstein & Sons, 146 bls. from London, 123 from Leith and 238 from Rotterdam Equitable Trust Co., 26 bls. from Havre Maurice O'Meara Co., 51 bls. from Antwerp; Chemical National Bank, 74 bls. from Rotterdam; W. Schall & Co., 65 bls. from Rotterdam; Second National Bank of Boston, 348 bls. from Hamburg Textile Waste Merchandizing Co., 265 bls. from Rotterdam; Coal & Iron National Bank, 79 bls. from Havre; Kidder Peabody Acceptance Corp., 333 bls. from Antwerp; Order, 226 bls. from Manchester and 67 from Leith.

Rags

E. J. Keller Co., 250 bls. from Kobe, 300 from Oran, 5,105 from Hamburg, 804 from Bremen, 3,907 from Rotterdam, 859 from Copenhagen, 584 from Havre, 430 from Trieste, 719 from Antwerp, 71 from Stockholm, 101 from Genoa, 679 from Livorno and 80 from Leghorn; P. Berlowitz, 742 bls. from Antwerp, 160 from Rotterdam, 447 from Havre and 154 from Marseilles Strupp & Co., 305 bls. from Bremen and 479 from Hamburg; S. Birkenstein & Sons, 387 bls. from Bremen and 72 from Rotterdam; Daniel M. Hicks, Inc., 259 bls. from Rotterdam, 84 from London and 41 from Dunkirk; G. W. Millar & Co., 852 b's. from Rotterdam; Castle & Overton, 749 bls. from Rotterdam, 24 from Hamburg and 22 from Belfast; Salomon Bros. & Co., 93 bls. from Hamburg and 200 from Alexandria; Maurice O'Meara Co., 3 bls. from London, 60 from Dunkirk, 73 from Antwerp and 17 from Rotterdam; R. Bishop Mfg. Co., 307 bls. from Dunkirk; C. R. Spence & Co., 45 bls. from Leith; Stone Bros. & Victor Galaup Co., 58 b's. from Havre; Albion Trading Co., 8 bls. from Gothenburg and 186 from Marseilles; Whaling Waste Products Co., 232 bls. from Rotterdam; Katzenstein & Keene, 165 bls. from Marseilles and 93 from Havre; G. M. Graves Co., 31 bls. from Rotterdam and 77 from Antwerp; Textile Waste Merchandizing Co., 595 b's. from Rotterdam; J. M. Jaffee, 102 bls. from Bordeaux; B. Polonsky, 26 bls. from Dunkirk; E. Butterworth & Co., 180 bls. from Marseilles and 87 from Barcelona; J. J. Patricof, 173 bls. from Rotterdam; G. Carrizzo, 209 bls. from Naples; D. Antolini Co., 4 bls. from Naples; Atterbury & McKelvey, 254 bls. from Rotterdam; R. Wolf, 62 bls. from Rotterdam; Equitable Trust Co., 49 bls. from Antwerp, 226 from Hamburg, 63 from Alexandria and 361 from Marseilles; National City Bank, 56 bls. from Antwerp, 157 from Bremen and 206 from Barcelona; Chemical National Bank, 45 bls. from Bremen and 167 from Rotterdam; Mechanics & Metals National Bank, 97 bls. from Rotterdam, 238 from Venice, 28 from Glasgow, 22 from London and 146 from Hamburg; Second National Bank of Boston, 369 bls. from Manchester and 463 from Bristol; Chase National Bank, 541 bls. from Hamburg and 382 from Bremen; British Bank of South America, 73 bls. from Manchester and 38 from Liverpool: International Acceptance Bank, 278 bls. from Hamburg, 102 from Bremen and 178 from London; Philadelphia National Bank, 62 bls. from Hamburg, 51 from Rotterdam, 55 from Bremen, 356 from Trieste and 133 from Newcastle; Banque Belge, 198 bls. from Hamburg, 73 from London, 21 from Liverpool, 177 from

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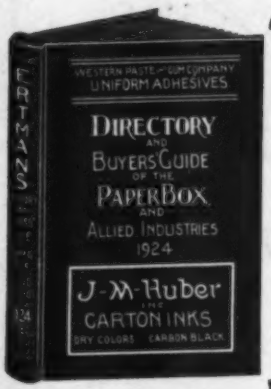

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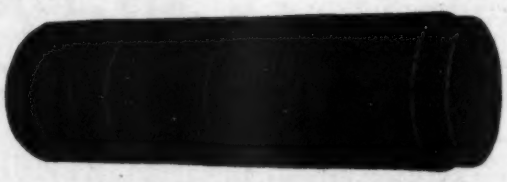

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

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Dept. 17 BAY CITY, MICHIGAN

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Philadelphia, Pa.....318 Widener Bldg.
Pittsburgh, Pa.....223 Fulton Bldg.

"Steel for Strength—Wood for Durability"

Bremen, 13 from Antwerp and 20 from Havre; Atlantic Exchange Bank & Trust Co., 229 bls. from Rotterdam; Union National Bank of Philadelphia, 22 bls. from Hamburg; National Bank of Commerce, 80 bls. from Bremen; Seaboard National Bank, 42 bls. from Bremen; Garfield National Bank, 82 bls. from Bremen and 241 from Hamburg; Anglo-South American Trust Co., 206 bls. from Leith, 344 from Hamburg, 435 from Glasgow and 27 from Liverpool; Guaranty Trust Co., 394 bls. from Hamburg, 79 from Havre, 113 from Leghorn, 79 from London and 81 from Naples; Bankers Trust Co., 274 bls. from Hamburg and 260 from Bremen; American Exchange National Bank, 36 bls. from Rotterdam; Coal & Iron National Bank, 86 bls. from Antwerp, 338 from Rotterdam and 322 from Marseilles; Manufacturers Trust Co., 140 bls. from Barcelona; Bank of New York & Trust Co., 84 bls. from Barcelona and 41 from Hamburg; J. A. Cambere, 10 bls. from Constantinople; Brown Bros. & Co., 181 bls. from Bremen, 249 from Manchester, 156 from Belfast, 186 from Hamburg and 303 from Newcastle; W. Schall & Co., 55 bls. from Manchester and 280 from Newcastle; R. F. Downing & Co., 225 bls. from Manchester, 551 from Rotterdam and 25 from Havre; T. D. Downing & Co., 34 bls. from Havre; A. W. Fenton, Inc., 165 bls. from Hamburg and 633 from Rotterdam; Huth & Co., 99 bls. from Antwerp; Order, 90 bls. from Liverpool, 605 from Bristol, 179 from Genoa, 162 from Rotterdam, 217 from Manchester, 55 from London, 85 from Barcelona, 621 from Hamburg, 48 from Alexandria and 49 from Antwerp.

Miscellaneous Paper Stock

Equitable Trust Co., 605 bls. from Antwerp and 192 from Hamburg; Baring Bros. & Co., 86 bls. from Glasgow; Coal & Iron National Bank, 81 bls. from Glasgow; National City Bank, 102 bls. from Hamburg; E. J. Keller Co., 559 bls. from Hamburg and 175 from Antwerp; Salomon Bros. & Co., 65 bls. from Dunkirk; Amsinck, Sonne & Co., 78 bls. from Dundee; T. D. Downing & Co., 10 bls. from Dundee; Chase National Bank, 21 bls. from Dundee; Mechanics & Metals National Bank, 137 bls. from Palermo and 64 from Dublin; Castle & Overton, 31 bls. from Bremen; C. R. Spence & Co., 185 bls. from Bristol and 40 from Glasgow; Prince & Kennedy, 67 bls. from Dublin; Brown Bros. & Co., 270 bls. from Dublin; State Bank, 74 bls. from Glasgow; Anglo-South American Trust Co., 330 bls. from Antwerp; Order, 2,111 bls. from Hamburg, 120 from Glasgow, 101 from Liverpool, 120 from Dundee, 52 from Southampton and 193 from Manchester.

Paper

Judging from arrivals at the port of New York, imports of paper into the United States in September dropped off considerably. There were by far smaller amounts of wrapping and news print received at New York during the month than were imported at the same port in the several previous months. However, some fair-sized shipments of both wrapping and printing paper arrived from Germany and the Scandinavian countries, while receipts of cigarette, hanging, filter, drawing and other kinds of paper were moderately large. Importations of paper of all kinds through the port of New York in September follow:

Printing

Perry, Ryer & Co., 4 cs. from Bremen and 408 bls. from Glasgow; Oxford University Press, 5 cs. from Liverpool; Equitable Trust Co., 588 rolls from Gothenburg; J. Andersen & Co., 98 rolls from Gothenburg; Street & Smith Publishing Corp., 201 rolls from Hamburg; Drinkhansen & Hollkott Paper Co., 977 rolls from Hamburg; P. C. Zuhlke, 217 cs. from Antwerp; Norwegian Paper Mills Agency, 163 rolls from Christiania; C. Steiner, 34 cs. from Hamburg, 44 cs. from Rotterdam and 60 bls. from Bremen; Seaman Paper Co., 455 rolls from Hamburg; W. Hartmann & Co., 537 rolls from Hamburg; Panama-Pacific Co., 190 rolls from Hamburg; F. D. Ramm, 3 cs. from Hamburg; Kennedy & Co., 2 cs. from London; E. Naumberg & Co., 38 rol's from Christiania and 185 rolls from Hamburg; C. G. Keferstein, 362 rolls from Hamburg; New York & Hauseatic Corp., 285 rolls from Hamburg; Dell Publishing Co., 375 rolls from Hamburg; Second National Bank of Hoboken, 6 cs. from Hamburg; P. H. Petry & Co., 21 cs. from Hamburg; B. F. Drakenfeld & Co., 32 cs. from Liverpool; H. Reeve Angel & Co., 5 cs. from London and 215 rolls from Bremen; Pulp and Paper Trading Co., 64 rol's from Rotterdam; Bank of New York & Trust Co., 420 rolls from Christiania; Melby, Kuttroff & Co., 5 rolls from Trieste; Traders Paper Co., 407 rolls from Hamburg; Maurice O'Meara Co., 175 bls. from Bremen; Hudson Trading Co., 173 rolls from Hamburg; International Acceptance Bank, 539 rolls from Hamburg; J. P. Heffernan Paper Co., 22 bls. from Hamburg; Order, 650 rolls

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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

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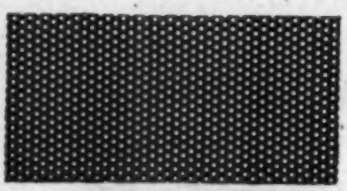
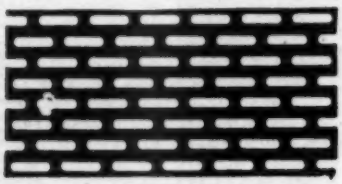
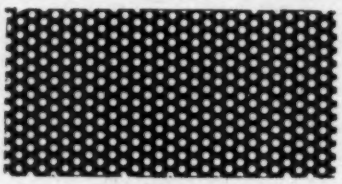
"The Wrapper that Delivers the Goods"

Perforated Metal Screens for Pulp and Paper Mills


.065 inch round


⅛ x ½" Slots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UNION BRONZE SCREEN PLATES
(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

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Originators and Oldest Manufacturers
OF THE
Cast Bronze Screen Plate

ALSO SPECIALIZE IN
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PERFORATED METAL SCREENS
in all metals for pulp and paper mills
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All Products Guaranteed to Suit You

STEEL SHELL BURRS YELLOW JACKET SHOWER

Read the "ROBERTS IDEA"

from Kotka, 426 rolls and 165 bls. from Hamburg and 3,063 rolls from Bremen.

Wrapping

J. F. Heffernan Paper Co., 254 rolls and 1,875 bls. from Hamburg and 897 bls. from Trieste; Corn Exchange Bank, 1,794 rolls and 3 bls. from Gothenburg; D. S. Walton & Co., 80 bls. and 68 rolls from Gothenburg and 106 bls. from Copenhagen; Brooklyn Standard Bag Co., 142 rolls from Gothenburg; C. K. MacAlpine & Co., 90 bls. and 686 rolls from Gothenburg and 4 rolls from Hamburg; Arkell Safety Bag Co., 279 rolls and 58 bls. from Gothenburg; Wilkinson Bros. & Co., 326 rolls and 66 bls. from Trondhjem and 155 bls. from Hamburg; International Acceptance Bank, 11 bls. from Christiania and 86 bls. from Hamburg; Schenkers, Inc., 17 bls. from Hamburg; Borregaard Co., 573 bls. from Gothenburg; Chemical National Bank, 6,347 rolls and 10 bls. from Gothenburg and 184 bls. from Hamburg; Birn & Wachenheim, 8 cs. from Rotterdam; Fidelty International Trust Co., 34 bls. from Hamburg; Blauvelt-Wiley Paper Mfg. Co., 145 bls. from Glasgow; Maurice O'Meara Co., 104 bls. from Hamburg, 184 bls. from Greaker and 1,622 bls. from Rotterdam; Hudson Trading Co., 11 cs. from Rotterdam; Republic Bag & Paper Co., 315 bls. from Rotterdam; P. H. Petry & Co., 76 bls. from Glasgow; C. Steiner, 12 cs., from Rotterdam; Import Paper Co., 6 cs., from Rotterdam; Pulp and Paper Trading Co., 4 cs., from Rotterdam; F. C. Strype, 11 cs. from Antwerp; Textile Paper Tube Co., 46 rolls from Liverpool; Equitable Trust Co., 75 bls. from Hamburg; Order, 2,453 bls. and 64 rolls from Hamburg, 477 bls. from Copenhagen and 17 bls. from Christiania.

Cigarette

P. J. Schweitzer, 181 cs. from Havre; R. J. Reynolds Tobacco Co., 890 cs. from St. Nazaire; De Manduit Paper Corp., 159 cs. from St. Nazaire; American Tobacco Co., 800 cs. from Bordeaux; Miguel, Costa & Miguel, 5 cs. from Barcelona; Rose-Frank Corp., 26 cs. from Marseilles; J. P. Mouller, 9 cs. from Bordeaux; Standard Products Corp., 232 cs. from Havre; F. P. Gaskell & Co., 30 cs. from Havre; Suarez & Crespo, 7 cs. from Alicante; Order, 2 cs. from Barcelona.

Writing

Guibont Freres & Co., 55 cs. from Havre and 27 cs. from Southampton; J. C. Robold & Co., 26 cs. from London; A. Goodman & Co., 21 cs. from Liverpool and 3 cs. from Trieste; J. W. Hampton, Jr., & Co., 2 cs. from Southampton and 15 cs. from Hamburg; American Exchange National Bank, 2 cs. from Hamburg; W. J. Byrnes & Co., 10 cs. from Havre; J. Kennedy, 9 cs. from Bordeaux; F. C. Strupe, 3 cs. from Rotterdam; Order, 40 bls. from Trieste.

Drawing

E. Dietzgen & Co., 35 cs. from Rotterdam and 10 cs. from Hamburg; Keuffel & Esser Co., 97 cs. and 67 rolls from Hamburg, 19 cs. from Liverpool and 41 cs. from Rotterdam; H. Reeve Angel & Co., 16 cs. from London; Interocean Forwarding Co., 3 cs. from Hamburg; Order, 6 cs. from London.

Filter

A. Giese & Son, 7 rolls from St. Nazaire and 5 cs. from Hamburg; H. Reeve Angel & Co., 39 cs. from London and 16 bls. from Bordeaux; E. Fougera & Co., 19 cs. from Southampton; J. Kennedy, 4 cs. from Bordeaux.

Tissue

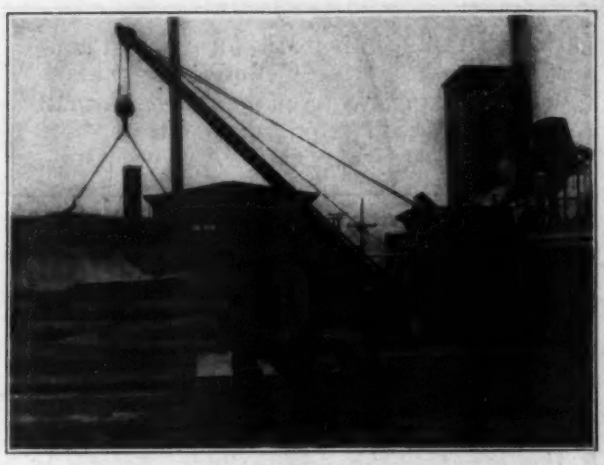
J. B. Mast & Co., 2 cs. from Genoa; T. D. Downing & Co., 3 cs. from Hamburg; Phoenix Shipping Co., 12 cs. from Rotterdam; Iwai & Co., 17 cs. from Kobe.

Photo

Globe Shipping Co., 846 cs. from Bremen; P. C. Zuhlke, 298 cs. from Antwerp; Gevaert Co. of America, 104 cs. from Antwerp and 27 cs. from Rotterdam; J. J. Gavin & Co., 8 cs. from Liverpool; G. Gennert, 8 cs. from Bremen; Eastman Kodak Co., 5 cs. from Kobe; T. F. Wilmot & Co., 2 cs. from London.

Hanging

F. G. Prager & Co., 2,322 rolls from Rotterdam; Eleto Co., 34 cs. from Havre; W. H. S. Lloyd & Co., 5 bls. from Liverpool and 14 bls. from London; Bloomingdale Bros., 4 cs. from Havre; C. A. Haynes & Co., 15 bls. from London; R. F. Downing & Co., 7 bls. from Southampton; A. C. Dodman, Jr., & Co., 6 cs. from Southampton and 5 cs. from Antwerp; Globe Shipping Co., 39 cs. from Havre; J. W. Hampton, Jr., & Co., 536 bls. from Rotterdam; Drinkhansen & Hollkott Paper Co., 524 rolls from Hamburg and 332 rolls from Rotterdam; F. J. Emmerich & Co., 8 cs. from Hamburg; F. A. Binder, 2 cs. from Bremen;



TYPE T CRANE USED BY GOSHEN VENEER CO.

Specially Built to Suit the Capacity of Your Mill

The cost of handling pulpwood and logs is surprisingly low when you use a crane that is designed especially for your mill.

To buy a machine simply because the manufacturer builds only a certain size is poor economy. Our cranes range in capacity from 5 tons to 50 tons and are designed for handling small pulpwood with a grapple or single logs weighing up to 10 tons.

They are mounted for traveling on railroad track or on the ground surface and may be equipped with either electric, gasoline or steam power.

It will pay you to investigate. Our bulletin 241 is interesting and is sent free on application.

ORTON & STEINBRENNER

Crane Builders

608 S. Dearborn St. **Chicago, Ill.**

FOR SALE—Paper Mill located in Pennsylvania—52" trim Cylinder Machine—equipped to run colored specialties—small amount of cash required. Address, The Paper Industry, Box 69.

Belted Type Turbine for sale. Unit now in first-class operating condition consisting of 400 to 500 H. P. Turbine Heavy Reduction Gear and Rockwood Paper Pulley with Heavy Pedestal Bearings; all mounted on substantial sub-base. Surface Condenser also available, although machine can be operated non-condensing up to 300 H. P. if desired.

Has been used for driving Beater Room. Is suitable for driving Jordan or Paper machine. Is as good as new in every respect. Reason for selling—electrification of Beater Room. For information apply to Rush Machinery Company, 932 Olive Bldg., Pittsburgh, Pennsylvania.

Paper and Pulp Knife Grinders
using
Sectional Wheel, Cup Wheel or Straight Wheel
Catalog on Request
BRIDGEPORT SAFETY EMERY WHEEL COMPANY
102 Knowlton Street, Bridgeport, Conn.

SPECIAL SALE

Immediate Delivery

ROTARY CONVERTERS

12—New Rotary General Electric Converters, 528-660 K.W. with synchronous Boosters, 240-300 volts, 25 cycle, type HCC, 6 phase.

Taylor Stokers—New

5—7 retorts 21 Tuyere Stokers.

Technical Economist Corp.

40 Rector Street, New York, N. Y.
TELEPHONE: WHITEHALL 820 CABLE: HERENCO

Paper Mill Machinery

120" Tissue Paper Machine.
Two Jones beaters 66"x57".
Moore & White four drum winder.
60" Hamblet cutters with Moore & White layboys.
One 72" Holyoke super calender.
Four 60" Holyoke super calenders.

For Sale By

FRANK H. DAVIS CO.

175 Richdale Avenue Cambridge, Mass.

1—5 H. P. W. A. Jones Speed Reducer ratio 143 to 1—2.
1—Connersville Blower 7 lb. pressure 16½ cu. ft. displacement per revolution.
Root Blowers Nos. 1, 2, 3, 4, 5, 5½, 6. 1 to 5 lbs. pressure.
Electric Hoists—½, 1, 2, 3, 5 tons capacity.
Air Hoists and Air Compressors.

Scully-Jones & Company

3615 South Ashland Avenue CHICAGO

Ticonderoga Machine Works

TICONDEROGA, N. Y., U. S. A.
MANUFACTURERS OF

WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control
(PATENTED)

WARREN IMPROVED PATENT DOUBLE DRUM WINDERS

Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties

SEND FOR OUR BULLETIN

Erstein & Co., 4 cs. from Havre; Titan Shipping Co., 5 cs. from Hamburg.

Board

H. Reeve Angel & Co., 4 cs. from London; O. M. Baxter, Inc., 40 cs. from Gothenburg; O. G. Hempstead & Sons, 50 cs. from Bremen; Fiber Case and Novelty Co., 146 bls. from Gothenburg; A. Vuyck, 434 rolls from Rotterdam; F. G. Prager & Co., 20 cs. from Hamburg; Friedman & Co., 29 cs. from Hamburg; Bendix Paper Co., 56 cs. from Hamburg; H. Hollesen, Inc., 112 bls. from Hamburg; Corn Exchange Bank, 25 bls. from Hamburg; Order, 200 bls. from Trieste.

Miscellaneous

Japan Paper Co., 10 cs. from Rotterdam, 10 cs. from Havre and 4 cs. from Southampton; Hensel, Bruckmann & Lorbacher, 2 cs. from Rotterdam, 46 cs. from Bremen, 17 cs. from Havre and 23 cs. from Hamburg; D. C. Andrews & Co., 15 cs. from Gothenburg; Coenca-Morrison Co., 9 cs. from Havre and 6 cs. from Southampton; P. Puttmann, 5 cs. from Marseilles; Ault & Wiborg, 32 cs. from Hong Kong; Whiting-Patterson Paper Co., 50 cs. from Southampton; Dupont Cellophane Co., 15cs. from Havre; Pitt & Scott, 9 cs. from Havre and 4 cs. from Antwerp; White-Burbank Paper Co., 3 cs. from Glasgow; Marcus Ward, Inc., 6 cs. from Glasgow; Birn & Wachenheim, 20 bls. from Hamburg; Tice & Lynch, 2 cs. from London; P. H. Petry & Co., 51 bls. from Glasgow and 10 cs. from Hamburg; Louis DeJonge Co., 101 cs. from Antwerp; Newark Paraffine and Parchment Paper Co., 6 rolls from Rotterdam; H. Reeve Angel & Co., 3 cs. from Kobe; F. L. Kraemer & Co., 4 cs. from London and 11 cs. from Antwerp; American Shipping Co., 8 cs. from Hamburg; New York Trust Co., 10 bls. from Trieste; Import Trading Co., 37 cs. from Bremen; Tiffany & Co., 3 cs. from Havre; E. Daiber, 5 cs. from Antwerp; International Forwarding Co., 10 cs. from Havre; American Express Co., 14 cs. from Havre; G. W. Sheldon & Co., 2 cs. from Havre; Davies, Turner & Co., 2 cs. from Hamburg.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 11439—Paper milk containers. San Juan, Porto Rico. Purchase desired.

No. 11440—Old newspapers. The Hague, Netherlands. Agency desired.

No. 11460—News print and letter paper. Porto Alegre, Brazil. Agency desired.

No. 11441—Paper. Bahia, Brazil. Purchase desired.

No. 11407—Roofing and building paper. Havana, Cuba. Purchase desired.

No. 11442—Photographic paper. Amsterdam, Netherlands. Purchase desired.

No. 11420—Caustic soda. Recife, Brazil. Purchase desired.

No. 11494—Caustic soda. Rangoon, India. Agency desired.

No. 11516—Soda ash. Rotterdam, Netherlands. Purchase and agency desired.

No. 11627—Cigarette paper in rolls. Tegucigalpa, Honduras. Purchase desired.

No. 11626—Pasteboard and paper in general. Havana, Cuba. Agency desired.

No. 11598—Printing and papermaking machinery. Vratza, Bulgaria. Purchase and agency desired.

No. 11638—Printing presses for printing on roll wrapping paper. Dresden, Germany. Purchase desired.

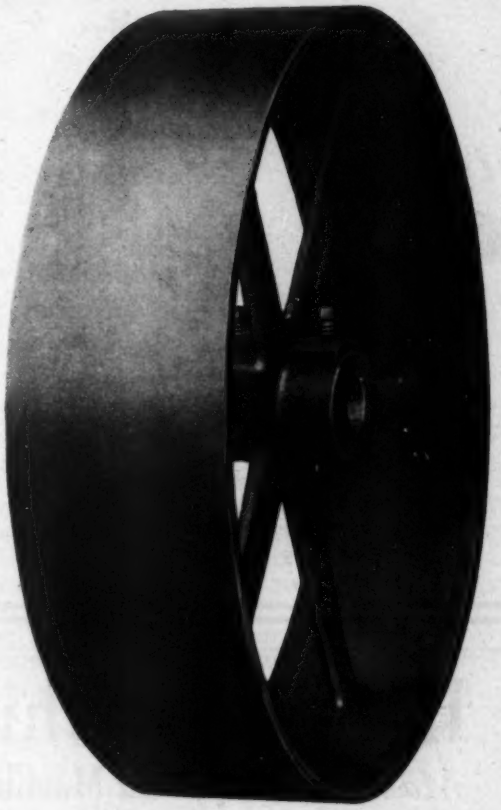
No. 11670—Soda ash. Bombay, India. Purchase and agency desired.

Institute of Research Launched at Lehigh

Announcement was made here today of the launching of the Lehigh Institute of Research by the administration of Lehigh University, Bethlehem, Pa.

In announcing the purposes of the institute, the Lehigh board of trustees, of which E. G. Grace, president of the Bethlehem Steel Corporation is president, stated that the object is "to encourage and promote scientific research and scholarly achievement in every division of learning represented in the organization of the university; and in recognition of the need for further and more exact knowledge in science and in the application of science to the affairs of modern life. It is believed that this organization will be helpful in stimulating interest in liberal and professional education; and that it will prove to be of value to the professions and industries of the nation."

CAST IRON PULLEYS



Are superior to others because they are permanent in structure, true-running and are suited to a wider range of service than any other type of pulley. The **Cast Iron Pulley** properly made possesses every quality essential to the make-up of an ideal pulley.

Almost every user of power has had pulley troubles and has righted the troubles and made the drives satisfactory by installing **Cast Iron Pulleys.** In most all cases **Cast Iron Pulleys** of suitable construction replaced other types of pulleys.

It Was a Cast Iron Pulley That Finally Stood Up

Your pulley troubles can be prevented if you use **Cast Iron Pulleys** in the initial installation.

T. B. Wood's Sons Co.

Chambersburg, Pa.

New England Branch and Warehouse, 624 Main Street, Cambridge, Mass.
Southern Office, 312 Masonic Temple, Greenville, S. C.

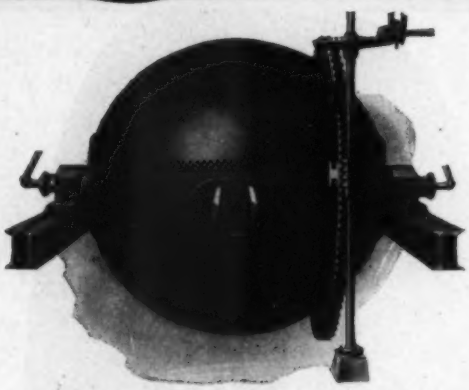
Makers of Power Transmitting Machinery exclusively and continuously since 1857

The Biggs Boiler Works Co. Akron Ohio

GLOBE and CYLINDER

ROTARY BLEACHING BOILERS

for Years of Dependable Cooking and Bleaching



Globe and Cylinder Rotary Bleaching Boilers
Digesters
Riveted Steel Tanks
Flumes, Smokestacks, Penstocks, General Steel Plate Construction of every description

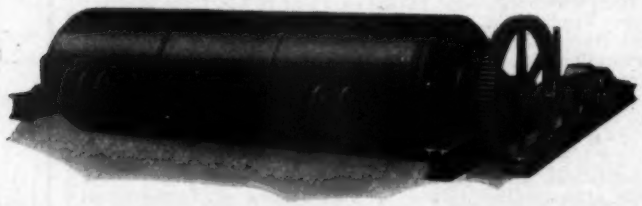
Big Reasons for Biggs Rotaries

WHEN a concern has been building a product successfully for a great many years, the tendency is simply to take the situation for granted without inquiring into the reasons for such success. But there are reasons, nevertheless, big reasons for the widespread preference of paper mill superintendents for Biggs Rotary Boilers.

Experience and character of the builder, ability to give good service on delivery, performance of the product for over thirty years, low maintenance cost, these are all known factors in dealing with Biggs.

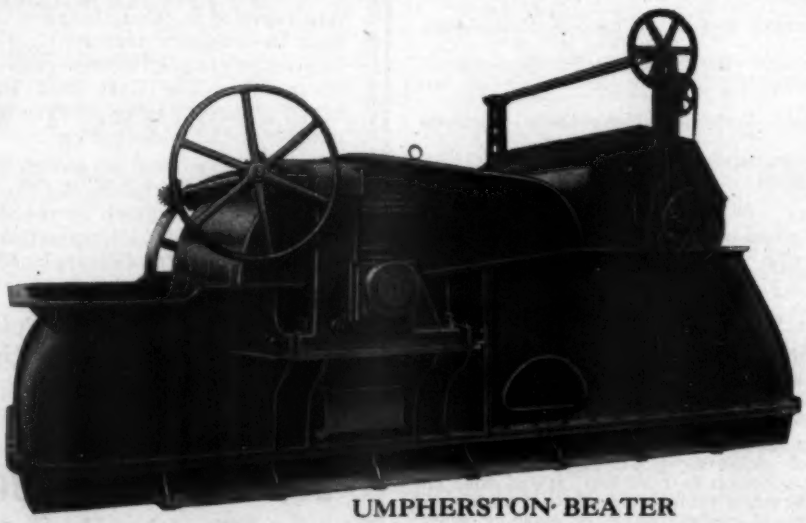
Let us figure with you on any of the equipment listed herewith.

The Biggs Boiler Works Company
Seneca Place and Case Ave. Akron, Ohio
Eastern Representative, Mr. Grenville A. Harris, 15 Park Row, New York City



Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills



UMPHERSTON BEATER

Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.